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[*For continuation of "Analysis of Advertisements" see page* lxxxi.]

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THE BUILDER

A JOURNAL FOR THE ARCHITECT AND CONSTRUCTOR.

WITH WHICH IS INCORPORATED "THE BRITISH ARCHITECT."

VOL. CXXVI.—No. 4224. JANUARY 18, 1924.

THE ACCOMMODATION CHALLENGE.

MAJOR BARNES is fortunate in his moment for the appearance of his book.* It is at once a survey and a challenge, but because the survey is so conscientious, and the evidence amassed so exhaustive and detailed, the challenge gains in importance and is bound to make itself heard. Briefly, Major Barnes contends that private enterprise has never wholly met the housing requirements of this country, that in the present circumstances it is practically impossible for it to regain the efficiency even of pre-war days, and that whether we like it or not we are faced with a permanent State responsibility for housing the "working classes"; though he believes that the incidence will be gradual and not what he describes as alarming. It is this conclusion which will mainly attract attention to the book, coming as it does at a moment of political crisis rich in possibilities. No one can deny the competence of the author to deal with his subject; he has special knowledge and special experience, and, moreover, he possesses that art of concentration which devours every particle of evidence required to encompass the situation under review. But it is exactly here that the value of his judgment appears to weaken. Few sayings embody greater truth than that of not seeing the wood for the trees. Major Barnes sees the trees and classifies them with the enthusiasm of a scientist; but it is as trees that he sees them, and the forest in its relation to the surrounding country is overlooked.

He quite rightly asserts that the average working man cannot at the present rate of wages occupy a house of reasonable standard and pay an economic rent (including rates), even when he is in work. That this is a truth of extraordinary gravity and danger no one can deny, but it certainly can be denied that it implies the failure of the building industry in particular; rather, we contend, it is an indictment of industry as a whole—a failure which, if it persists, must involve the collapse of civilisation as we know it. The justification of the industrial principle depends on its ability to supply the public with the ordinary commodities of life, and also to maintain adequately the *personnel* dependent upon it and upon which it in turn depends. If it cannot organise itself directly to answer the demand of its own workers (and we are very far from suggesting that it has lived up to its responsibilities in the so-called "normal" years) and to support them with the means of life, even at the minimum subsistence level, including proper accommodation, then our civilisation is beyond hope. State help is no permanent cure for such a condition, however essential it may be in an emergency; by it the productive capacity of a people can only be weakened. In regard to the efficiency of State administration, Major Barnes is emphatic; he tells us that "such public provision is as a rule more expensive and less efficient and is, therefore, a regrettable necessity only to be accepted if it is inevitable."

Is it inevitable? We must admit that all forms of State help are an indirect subsidy to wages, and that in giving it the State pays for the casualties which industry fails directly to relieve. That certain burdens of industry are better "pooled" on public lines is undeniable, and it is the science of statesmanship to adjust the balance between State and industry for public services in special circumstances. As an example, some form of State assistance for housing after the war was clearly a national responsibility. There is, and should be, no set rule for deciding what is and what is not a special circumstance that cannot equitably be met by industry, but the principle that responsibility for the maintenance of its employees ultimately rests on the engine of production appears to us incontrovertible. In this adjustment lies the political arena of the future. Certainly our housing supply is at the moment very far from being self-supporting, but to assert with cheerful mournfulness with Major Barnes that after all public education did not destroy us, so neither need (very gradual) public rent subsidy, is to set up an unfair comparison. Education is a special charge on a special section of the public at a special time, which is best met and best administered centrally. State education strengthens a public responsibility that is entirely healthy and socially just, and it is admittedly efficient. Accommodation, far from being a special charge, is general in its widest sense, and instead of being better administered centrally is, even according to a sympathiser like Major Barnes, "more expensive and less efficient." If our productive organisations cannot recover and supply what will meet the accommodation rental, we cannot successfully substitute a permanent policy of small State workhouses. To us, we admit, there appears to be no heroic solution; it resolves itself solely into the wider problem of the effective wage and the ability of industry to provide it. Given the effective wage to pay an economic rent, the building industry will provide the houses more efficiently than any other agency to whatever standard the State and public opinion may and should impose.

We confess we are not hopeful of any such adjustment—for some time at least—being thought out and introduced on practical lines. Conflict and clamour are the enemies of reason, but some policy must be evolved probably associated with a form of national insurance on the broadest basis. The achievements of individual firms where they have been boldly executed in a social spirit have shown what can be done. Whether private enterprise takes the form of co-operation, profit-sharing, or the application of the "Whitley" principles, the public has learnt that good management is good business as well as good Christianity.

The fate of civilisation depends upon the fate of its citizens, and the ability to pay for a home is the hall-mark of independence. While admitting past shortcomings, we believe that industry will yet be able to justify her existence—as she has not hitherto done in the years of plenty—but she will have to set her house in order, and secure the independence of her own servants.

Although we have attempted to answer the particular challedge to the building industry, we may well thank Major Barnes for his amazing store of reference material, and for what we hold to be more valuable, the insistence on the gravity of the accommodation problem. We purposely avoid mentioning the word "housing" because the author tells us that "it is no part of this book to discuss the qualitative aspect of housing." Such an attitude is, in our opinion, untenable, since questions of cost are clearly involved. Also it encourages the idea that standard and architectural merit are unpractical, or anyhow do not necessarily affect practical issues, and such a delusion can only set back the cause of social reform, which is intimately connected with the size and character of our new houses. Apart from this criticism we believe that this volume will provide a valuable book of reference, one which no student of social conditions can afford to neglect.

* "Housing: The Facts and the Future," by Harry Barnes. London: Ernest Benn, Ltd. Price 25s. net.

NOTES.

Modern Architecture.

THE paper read by Professor Richardson at the Architectural Association on Monday night dealt with modern architecture and with the attitude we must adopt towards it if we are to produce a living architectural language. It was satisfactory to find that no single speaker said anything in favour of the existing state of affairs, neither did anyone deny Mr. Goodhart-Rendel's contention that we have precisely the architecture we deserve. It may be that every generation imagines itself to stand at a turning-point in the world's history, faced with unique opportunities, but very few have such excellent reason for such a belief as has the present one. A world upheaval is invariably followed by a period of energetic reform, and the question of whether war, with all its horrors and folly, is the only means of promoting this is one of the most difficult with which we can be faced. The attempt to understand the incomprehensible is always stimulating, but it must not be forgotten that inquiry into an art form, such as the source of beauty in architecture, is unlike a definite and limited scientific investigation in that there is no absolute answer.

House near Barcelona, Spain.
[Built of reinforced concrete.]

The Advertisement of Architecture.

THE first annual general meeting of the Architecture Club was held on May 29, 1923, and now we have before us the first annual report, showing what are the activities of the club, and these may be pronounced a decided success for a first year's effort. It will be noted that "there can be no suggestion that the club supposes itself to include all the competent architects in the profession," and is only to be regarded as a small propagandist body. It is well that this has been stated, for the attempt to fix standards of quality is a very dangerous business, especially at a time like the present, when the distribution of awards and honours is so grotesque. We shall owe the club some gratitude if it helps to spread some enlightenment about architecture and architects amongst the public, and particularly if it clears away the fantastic notion that only those who are well known and advertised are capable. The promotion of the art of architecture is, of course, a great aim, and is not to be confounded with the advertisement of individual architects, however good their work may be. We want mainly to get the public to appreciate beautiful building and not to feel we are putting the well-being of the individual architect into the forefront of our propaganda. Hence, we wish the club all success.

House near Barcelona, Spain.
[Built entirely of reinforced concrete.]

A Notable Art Critic.

THE death of A. Clutton-Brock will be widely regretted as the loss of a distinguished writer and a man of sincere character. To his art criticism he brought that rare accompaniment of a synthetic approach, interpreting the deeper relations of art to life, and connecting it with those beliefs which give to it this fundamental endowment. His was no superficial approach, shaped on the fashion of the time or habit, in that his thoughts about art were ever placed on a background of human welfare, from which he surveyed it. Not too much concerned with catalogue numbers and the small change of ephemeral art criticism, he avoided any morbid attraction to extreme cults and the exclusiveness of schools, to preserve for art that intrinsic value which associates it with the virtues of a people, away from preciousness and professional pretension. It is not, perhaps, the time to gauge fully the value of his contribution and it will appear to some that his later writings showed a tendency to become hampered by a more pronounced doctrinal attitude, by some little loss of the common touch; a stage perhaps only temporary and preparatory to a wider comprehension freed from doctrinaire influences and piercing deeper those realities of which his earlier work reveals him to have had so clear a vision. Art criticism such as his is rare, nor will his place be easily filled. At a time when the unstable atmosphere of mere opinion so much prevails, the death of a man of pronounced and illuminated conviction is a real loss.

Protection of Churches. THE Report of the Central Committee for the Protection of Churches, the first issued and published by the Oxford University Press, gives an interesting account of the work of a very useful organisation, directed by a central organisation consisting of representatives from each Diocese. The proper care of our parish churches, which have suffered so terribly in the past, is a matter of such national importance, that it is most reassuring to know that some control and guidance through responsible advisers is now available, and that we may look for a security from the vandalism from which our churches have hitherto suffered. Not that the task of these Committees is at all an easy one. The once so acclaimed and orthodox Gothic Revival is now no longer regarded as such; we can see its works, and it is now judged by them. But in their desire to avoid the mistakes of the past and to secure that the average standard of work in churches shall conform to the restraints and traditions which are becoming to it, we must not conceal from ourselves the drawbacks lying in the nature of such Diocesan Committees of Taste, and though endorsing their usefulness at the present time, we may not afford to neglect the defects in all such bodies. Where taste only is concerned, their usefulness cannot be doubted. But the matter is not one of taste only, or to be settled by its decisions.

Taste and the Artist. COMMITTEES of Taste, owing to their strong adherence to precedent and antiquarian preference, their familiarity with the known, and with what has been good in art, are seldom safe judges of what is to be, and tend towards sterility, and when it comes to the consideration of creative work which in its nature will not conform to standards of taste so established, are prone to become an obstruction to the entrance of the new and abundant life included in the creative spirit of art, and are, therefore, hostile to growth. Taste and the antiquarian are useful guides, but not for new expression which holds its prerogatives from other sources, and we must be careful to remember that the office of such Diocesan Committees of Taste needs, in addition to themselves, the reinforcement of an independence and freedom of appreciation to include the new, the unknown, of personally endowed vision. We say this in no way to deprecate the present usefulness of these Committees which, we believe, are wholly to the good—until something better supersedes them. But for the clergy and laity it needs that they shall fit themselves to exercise a wise choice, gradually freeing themselves from such tutelage, and from the fetters of organisation, if there is to be a living growth in church art.

London Factories. ADMITTEDLY it is an advance when great factories are moved out of our crowded cities into the country, and the exodus made in 1920 by Messrs. Crosse & Blackwell was an important step very much in the right direction. It is, therefore, all the more regrettable to learn (from the recent published report on the company's position) that a move back to London has not only been recommended in the report, but is in process of adoption. Financial urgency is not one to be ignored, and the save in turnover is estimated at 4 per cent.; but, while we are not in a position to judge on the factors and circumstances that have led to the company's present situation and decision, we do most sincerely regret the failure of a policy which we had hoped might be a successful example to other firms. We can now only hope that the "model" factories to be erected at Bermondsey and on the river wharf will be equipped with up-to-date smoke consuming apparatus, and, further, that the company will make some housing provision for their employees in connection with this renowned and important business.

A Suggestion from Nature. DURING our recent visit to the Empire Exhibition we could not help feeling that the recent covering of hoar frost over the countryside emphasised the value of unity of effect in many congregated masses of building. Though the different forms of trees, bushes and hedges were left with their own distinct individuality, this covering of white frost produced an impressive breadth of effect. The universal white at the White City Exhibition was a very effective quality, and it is rather to be regretted that a similar result is not to be had at Wembley.

Academic Dress. THE small amount of support which has been given to the idea of a professional costume may have been due to the influence of the wives and daughters of architects, but the average male mind probably sees in the proposal something of too doubtful a value. Anyhow, the majority of three at a small meeting in favour of it is an impossible verdict, and if the idea is pursued it will surely be essential to have a referendum of the whole profession.

Interior of a Bank at Barcelona, Spain.
[Reinforced concrete construction with marble decoration.]

GENERAL NEWS.

Professional Announcement.

Mr. R. R. Wentworth Hyde, M.S.A. (Singer, Hyde & Son), recently returned from the East, has reopened practice as architect and surveyor at Worthing. Manufacturers, &c., are invited to forward catalogues of building and engineering specialities to No. 8, Heene-terrace, Worthing.

Liverpool Memorial Hall.

On February 10 the Lord Mayor of Liverpool will lay the stone of the Liverpool Memorial Hall, which is being erected on a site near the memorial to the 55th Division at Givenchy. The Memorial Hall has been subscribed for by Liverpool people, and will be used as a library, cinema, &c.

Swedish Art.

The first representative exhibition of Swedish art in London, we believe, is now being held at the Royal Academy, and at the private view on Monday it appeared to be highly appreciated. There is a feeling of freshness of outlook and method about the work exhibited which comes with much varied interest in comparison with our usual Academy exhibitions. In figures, pictures, portraits and landscape, there is much to arrest attention, and sobriety of treatment and decorative quality are apparent in many of the pictures. The arrangement of pictures in groups of the work of the various artists enables one to see more clearly the individual qualities of each. That we could find an equal amount of breadth and dignity in an ordinary British exhibition is, we think, doubtful, and it is evident enough that though it may suffer in certain respects from some geographical isolation, Sweden has achieved an honourable and distinguished position in the world of art. There are some admirable pieces of sculpture shown, and one could have wished for more; we certainly might have derived much interest from exhibits of craftsmanship had it been possible to have included them in the exhibition. The writer finds the type in the catalogue both troublesome and inartistic. Some of the striking qualities of the exhibition are, however, reflected in the illustrations of the catalogue, such as the fine "Winter Night," by Karl Nordström; "The Hunter," by Bruno Liljefors; and the convincing portrait of Z. Renholm, by Ernst Josephson. How simple may be the materials for a successful picture may be seen in "A Swedish Farm," by Gustaf Rydberg. Such a picture as this is real, and we have the feeling of being able to move about from the foreground to the extreme distance. It would take a long review to do adequate justice to this well displayed Swedish exhibition.

COMPETITION NEWS

Result of Mint Competitions.

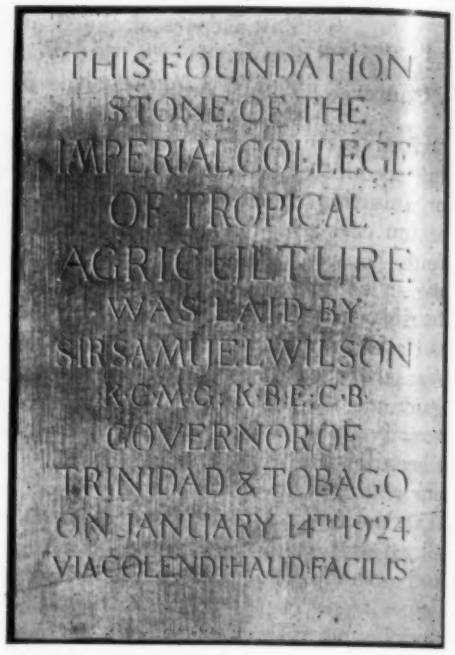
The Royal Mint announces the results of a series of competitions, held during the past year under the auspices of the Advisory Committee as follows:—

1.—For the best design for an award medal to exhibitors (£70), Mr. Percy Metcalfe, London. 2.—For a design for a plaquette commemorative of the holding of the exhibition (£70), Mr. E. Carter Preston, Liverpool. 3.—For the Royal Mint open competition for models for plaquettes illustrative of London, first prize of 100 guineas to Mr. Eric Bradbury, London. Two second prizes of 50 guineas each to Mr. A. Howes, Kew, and Mr. Percy Metcalfe, London.

Prizes of 25 guineas were also awarded to the following for designs symbolical of London as the capital city of the Empire:—Miss M. Kitchener, The Little Gallery, Ashtead, Surrey; Mr. W. H. Doxey, 8, January-street, Chorlton-on-Medlock, Manchester; Mr. C. L. J. Doman, The Studio, 9, Spencer Hill-road, Wimbledon, London.

4.—Designs for a small keepsake medal of the size of a shilling piece. First prize of £50, Mr. Percy Metcalfe, The Studio, Cleveland-road, Barnes; second prize of £20, Mr. William McMillan, 65, Glebe-place, Chelsea; third prize of £10, Mr. Langford Jones, 67, Shakespeare-road, Hanwell.

Bank at Barcelona, Spain.
[A reinforced concrete building with concrete-block facings.]



Foundation Stone.

Designed by Mr. H. C. CORLETTE, F.R.I.B.A.

[This stone is placed as a panel let into the base of one of the piers of reinforced concrete in the portico of the principal entrance to the College. Messrs. Foster & Dicksee, Ltd., are the contractors.]

Newcastle Concert Hall.

The sending-in day for this competition is Saturday, March 1, and not February 1, as advertised.

Talbot Memorial Park.

Design for a Lodge and Main Entrance Gates. A premium of 20 guineas is offered, and the successful architect will be engaged to supervise and carry out the work. Sending-in day, January 20.—*Banned by R.I.B.A.*

Coatbridge War Memorial.

The assessor, Mr. James Lochhead, F.R.I.B.A., has made the following award in this competition: 1.—(£75), Mrs. Edith Burnet Hughes, 27, Ashton-terrace, Glasgow, W.; 2—(£50), Messrs. Denny & Blain, architects, 144, St. Vincent-street, Glasgow; 3—(£25), Mr. Newbury A. Trent, 1, Beaufort-street, Chelsea, S.W. 3.

Newcastle Fire and Police Station.

Newcastle City Council have decided to hold a public competition amongst architects for plans for the proposed new police and fire brigade station on the Marlborough-crescent Market site. Buildings are to cover 2,465 yds., leaving the remainder for an open court yard. Exclusive of the installation of alarm system, the estimated cost is £12,500. Three prizes, amounting in all to £900, will be offered for designs, and an assessor, nominated by the President of the Royal Institute of British Architects and approved by the authority, will be appointed at a fee of £281 10s. to adjudicate.

Other Competitions.

Other competitions still open include the following (the dates given are, first the sending-in date, and second the issue of *The Builder* in which full particulars were given):—Newcastle Memorial (Jan. 5; Sept. 14. 1923). Essays on Heating and Ventilating (Mar. 31; Nov. 9, 1923). Holmside Hospital (Feb. 14; Dec. 14, 1923). Industrial Designs (June; Dec. 21, 1923). National Theatre (April 26). Monument to Sir Wilfrid Laurier (April 3; Dec. 14, 1923). Belfast Union Lighting (March; Nov. 9, 1923). Dunfermline War Memorial (March 8; Dec. 28, 1923).

THE COMPLEAT ARCHITECT.

By DUDLEY HARBRON.

XIII.—Wholesomeness.

It is not popular to talk of wholesomeness to those who associate the picturesque with squalor. There are some poets and many artists in paint and words occupied in gilding the dust by their sedulous lauding of ruins and decay. Their influence is widespread, their appeal insidious, so that it is with difficulty that our minds, accustomed to find solace in the contemplation of the deserted village, can be brought to regard with favour the regulated garden suburb. We are depressed by the present ill more fully than by those we know not of. As a contrast to these people, who find so much superficial interest in grime and smuts, there exists another school, who can find little good to say of many aspects of modern life. The former are romantics, the latter realists: both of them are right. A writer who seems to unite the two qualities, Mr. Stoughton Holborn, in his very interesting book, "The Need for Art in Life," states the case concisely:—

"Can we approach the modern city and say that it looks like a jewel in the surrounding landscape, or must we rather say that it is like some festering sore, spreading its smoke and chemical fumes and destroying the vegetation for miles around? . . . Look at the ugly factories, the ungainly warehouses, the mean streets and drab costumes, and, above all, the squalid and appalling horror of the slums."

We have only to open the morning paper to find some crudely reported incident which reinforces, if reinforcement were necessary, the general truth of his picture. Only the other day we were told in plain words, with inappropriate comment, the story of a woman who, having stolen some fish, sought to hide her culpability in the cellars of Les Halles. She forgot the cats, to which the basement of the Paris market is given over. The cats attacked her, and she was forced to issue from her hiding-place short of her fish, dishevelled, and bleeding. Could anything well be more disgusting, and yet there is not one word of comment that could lead one to suspect that there were anything unhealthy in such an incident. It will hardly be credited, but a reporter of this news found it funny! Such of us who live remote from the slums and ruins must not forget their menace. Unless architecture respond to the growing knowledge of the present of the need of health for life, it will have failed in the most cruel respect in consideration for the welfare of our fellow-men.

If we approach Mr. Holborn's city, past the leafless withered trees, the first sensation we experience, through our eyes, our throats, our nostrils, is the smoke, belching from countless chimneys. Activity! dreams the poet. Atmosphere! exclaims the artist. Pollution! answers the doctor. From their different angles all of them are right. The drifting haze does lend a wistful charm, so that we glimpse but shades instead of stark reality. A clear sky would reveal more crudity than we care to contemplate. None the less, men are more important than machines. The obvious waste of life in leisure to men, caused by being needlessly compelled to inhale impurities, continually to clean the ever-settling deposit of dirt on one's person and possessions, though it may entail expenditure in improvement of manufacturing methods, would more than be met by the saving in hospitals and gaols. Comically we bracket wholesomeness with hospitals, instead of making it so general that their services would not be required.

Architecture, if it is to be complete, must take cognisance of the absorbing need to promote an atmosphere within and without favourable to health. We are only just realising the full effects of our neglect to safeguard the integrity of those two essential requisites to existence—light and air; because they are free like the sea is no reason why we should cloud with carbon, pollute with sulphur, the atmosphere, or besmear our beaches with oil. If such evils are permitted to increase unchecked, life will not be worth living, if life were possible. Naturally such a sentiment will have far-reaching effects: chimneys will become as redundant as machicolations; let us hope that they did not linger so long after their use had ceased to be.

The provisions for lighting and ventilation of buildings are those which should most effectively regulate their proportions; the width of the rooms and their disposition should not be solely considered from the standpoint of intentional disposition, but should respect the need of their occupants for the necessities of life. It should not be left to a draper's assistant to have to write an article in the *Draper and Drapers' Times*, pointing out the unsuitability of basements as shopping centres. Architects who would scorn to be guilty of consigning the staff of a gentleman to the bowels of the earth to live, or to sleep among the roof spars, should now be mindful lest, having learned one lesson, they fall into kindred error, and relegate assistants and customers to a region where light has to be manufactured and air forced. Headaches and pale faces can only result at the mildest computation.

Whilst wholesomeness is needed by the occupant it must not neglect the onlooker. "Do unto others as ye would be done by" is still capable of revolutionising the world. Our neighbours' rights should not need the protection of the law.

Not only is building affected in this large manner by a regard for life: it is reflected, or should be, in the minute detail which, assembled, composes the structure. The persistence of parts and features appropriate to a clear climate have little to recommend them in one naturally humid as our own, more particularly as at present contaminated by smoke. The environment of plough lands and the prevailing winds will always carry a certain amount of foreign matter in suspension, and this, finding a favourable lodgment in nooks and crannies provided to give light and shade, ends in their rapidly losing the original power so to do. Respect for the canon of cleanliness entails a consideration of their conformation so that the cleansing properties of wind and rain shall be assisted and not impeded. That where their agency is not afforded the human hands which have the work to do shall find that the task has been lightened. If architects think more and always of these things there will be great hope for the art.

The disregard of wholesomeness is the opportunity awaited by those agencies of destruction, rot and rust.

Leicester City Rebuilding.

At a recent town's meeting a scheme to practically rebuild the city at a cost of £3,000,000 was defeated by the narrow margin of 679 votes to 532. The scheme, it is stated, has only been before the City Council for twelve months, and as a large number refrained from voting, the matter is as yet by no means settled. The enterprise can be described as popular in that it appeals to most of the leading men, the exponents of public opinion, and a certain proportion of the ratepayers. The work could not be taken in hand all at once. It would be set about in sections, one portion being completed before another was begun. In this way it might take 50 years in the doing.

DETAIL OF FRONT.

Municipal Auditorium, Colorado Springs, U.S.A.

Working Drawings by MR. C. E. THOMAS; Design and Supervision by MESSRS. T MACLAREN & T. D. HETHERINGTON.

CORRESPONDENCE.

The Menai Suspension Bridge.

SIR,—In suggesting that tenders be obtained for strengthening the Menai suspension bridge, as an alternative to the erection of a new structure, Mr. A. H. Stott may not be aware that, according to the statement of Sir Henry Maybury, of the Ministry of Transport, "a careful and detailed inspection of the bridge" revealed "increasing signs of fatigue and decay. The deterioration was accelerating, and the present bridge could only be maintained by a heavy annual increase in maintenance charges coupled with a further reduction in the tonnage permitted across the bridge. By those means the alternative of constructing a new bridge could only be postponed for a few years."

With regard to the broad question as to the suitability of reinforced concrete for the proposed new bridge, may I remind Mr. Stott that if the same prejudice against the use of a new material had existed when Telford's bridge was built that "graceful structure" (to use your correspondent's own words) would never have been built? It seems to me that a new material, when found suitable for a specific purpose both on the grounds of cost and strength, must be accepted, and it is the duty of architects to design beautiful structures in the new material. I enclose two photographs of reinforced concrete bridges, which, I think, amply prove that "graceful structures" can be built with this material if the designer sets out to make them so.

London. H. C.

Rolled Steel Joists.

SIR,—The writer of the article, "Advantages of the New Steel Joists," in your current issue, commenting upon these sections, claims for them more than the facts warrant. In each case in which, by example, he shows these beams to be better weight-carriers, the depth of the new is greater than that of the old beam with which it is compared. Generally for beams of similar section, economy as carriers of weight is proportional to depth, so that these results are to be expected. For joists not strictly similar, an economic index figure is given by :—

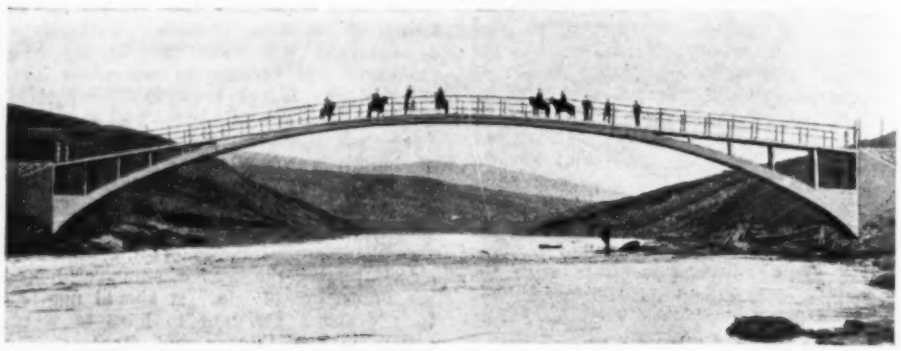
$$\frac{\text{Modulus of section.}}{\text{Area of section.}}$$

Applying this to the old and new 12-in. by 5-in. joists we get 3.895 and 3.906 respectively, a difference of 2.8 per cent. only in favour of the new, the web of which it should be noticed is thinner.

Consideration of the above will explain why it is that engineers so commonly clamour for depth—more depth.

W. H. T.

London.



Reinforced Concrete Bridge in Spain. *(See letter on this page.)*

America's Westminster Abbey.

SIR,—It is interesting to learn that America's new national cathedral to be built at Washington, at a cost of £10,000,000, will be Gothic, similar to our Abbey, with the exception of the centre tower—which will be carried up and pinnacled—and the chapter-house planned near the south-west tower. After the flood of gush a few months since on Wren's pagan temples, this should be particularly gratifying to Pugin's disciples.

E. VALE.

Weston-super-Mare.

"Mezzanine."

SIR,—Some years ago, while crossing Bayswater-road, the above term came into my mind and has stuck fast ever since.

At the time I was considering the best form of roadway-street for cities, and this may be said to be the first time I have put pen to paper on the subject directly.

During the memorable conference on town planning in London, in 1910, a Frenchman proposed what may be termed the "tier" street, which, I believe, consisted of one line of communication above the other, but wholly underground.

"Mezzanine" may be taken as a development with the top tier projecting in some degree above the surface level of the side pavements and with its roof forming a roadway in itself.

The lower ground levels or basements of the structure on either side might then have a pavement the same width as the normal pavement above, and be thus the better available for business purposes; whilst the lodgement of the service pipes, cables and wires could be suitably arranged.

The question of the crossings and points in such a street as described seems at first to be one of the utmost complexity, until it is resolved to make some of the former *cul de sacs* for wheeled traffic and to arrange the latter as a one-way-street with traffic "flying off at a tangent" in the direction it desired to proceed. The diameter of the one-way circular street might be considerable, and be filled in with a structure rising to a great height and capable of being used as a traffic centre and otherwise as a public place.

O.B.I.T.

Reinforced Concrete Bridge at Mizen Head, Ireland.
(See letter on this page.)

Problems of 1924.

SIR,—It is encouraging to find that, under the above title, you are of the opinion that the state of the building industry cannot be considered without touching upon political issues. The social spirit which places public interest before private advantage is gradually taking the place of the old-time game of politics, and decent-minded people now consider "programmes" without being affected by cheap jibes and newspaper stunts.

It is said that architecture reflects the state of contemporary civilisation. Surely the influence of architecture need not be so negative as all that. Architecture ought to be quite capable of leading the way in moral thought. As custodians of the Mistress Art, architects have a power to lead, which is not even second to that of the decent politician who puts the State before private gain.

You very rightly remark that "up to the present, this country has taken a mild pride in the fact that the Government has done less than almost any other in fostering the arts or even recognising them in any shape or form." Things are now changing. Oil companies are taking down their beastly posters over the countryside. A political leader has publicly uttered what most of us have been thinking in private or only in books up to the present—that private individuals should not be allowed to use a national housing shortage as a means of raising artificial prices. The same political party, if given the opportunity, will patronise the Arts in the highest sense of the phrase, so that private opinion may be enriched by the Arts.

If the architect is a man or woman worthy of his training and true to his ideals of good building, he should be acquainting himself with the problems of the human beings, who are the setting to his architectural compositions.

Architects who are, or ought to be, the guardians of the Nation's moral welfare, cannot entirely keep out of politics these days.

ALISTER G. MACDONALD.

TOWERS AND SPIRES.

II.—Tower of St. Front, Perigueux.

BY SIDNEY TOY, F.S.A., A.R.I.B.A.

As mentioned in the previous article, it is proposed in the treatment of this subject to confine attention to the examination of towers with spires erected over the vaults or central crossing of buildings. It is in these positions that the greatest structural difficulties were encountered, and it is here, therefore, that the examination will be attended with the greatest amount of useful instruction to the architects of the present day. In the case of towers with spires raised directly from the ground the dynamic problems are relatively simple and, generally, instances of this kind will be referred to only where they present analogous features of contemporary date or show conspicuous skill in structural treatment. In the case of central towers built of stone or kindred material, the difficulty of providing adequate support for both vertical and lateral pressures, without causing undue obstruction to the space below, is very considerable, and the architect must chose between external effect and internal convenience and beauty. But in edifices conceived on a large scale, well designed and skilfully built, a tower in this position forms an agreeable point of concentration dominating the whole structure and bringing all its parts into one group.

One of the earliest existing examples is that built over the vault of the "Latin" or more ancient part of the church of St. Front at Perigueux.* This tower stands over two bays of the church—which now forms a kind of narthex to the notable Byzantine addition with five domes—and rises to a height of 200 ft. (Fig. 1). Before beginning the erection of the tower proper the two bays of the church on which it was to stand were considerably strengthened and the work carried up to a height above the roof level to form a base for the new structure. Upon this base the tower was built in two tall receding stages and crowned by an open lantern with a conical stone cupola. Each of the two stages is pierced by two tiers of windows and is divided on all faces into three bays, the lower stage by wide pilasters, and the upper by engaged columns. Internally, the walls of each stage considerably overhang those of the stage upon which it stands; and the second stage, at the level of the upper cornice, is covered in by a hemispherical vault. Above the vault the angles of the square tower are stepped back externally to form the base of the lantern. The lantern is circular and has a colonnade of forty-eight antique columns, which stand upon a circular podium and support the conic cupola. These columns have evidently been taken from Roman buildings and are of varying diameters and heights.

It is difficult to state precisely the origin of the design of this tower, though it is Romanesque in detail. Probably it was the work of an intelligent architect of Perigord who was conversant with the campanili of the Venetian State, between which and Southern France considerable commercial intercourse existed at the period, and who in building a campanile of similar character adapted to his purpose the principle of superimposed orders he observed in the Roman Amphitheatre at Perigueux itself. It will be observed from the above brief description of the tower that its constructive principles are rudimentary and weak. The walls of the upper stage recede so much behind those of the lower that the engaged columns of the angles of the former stand partly above the arches of the windows of the latter, thereby increasing the thrust of these arches and their tendency to throw out the angles against which they abut. Again, the thrusts of the vault at the summit of the upper stage, thrusts which are greatly accentuated by the weight of the heavy lantern above, have apparently no other restraint than is offered by the walls against which they act. Some security was indeed provided here in the segmental arches of the upper windows which were actually lintels and arches in appearance only. These lintels, however, cracked under the forces to which they were subjected, and no longer fulfil the rôle of ties for which they were designed. There can be little doubt that, in conformity with the almost universal custom during the Middle Ages, both in the Levant and in Western Europe, timber ties were buried in the thickness of the walls between the tiers of windows, and that it is to this circumstance that the tower owes its stability. Notwithstanding this it has been found necessary for further security to partially block the upper tiers of windows and to build up entirely most of the square openings of the lower stage, as will be observed in Fig. 1. The external face of the cupola over the lantern is cut into a series of scallops which present a scale-like appearance with the scales pointing upwards. This is not primarily a decorative feature, but is provided in order that the rain water as it passes down the face of the cupola should be thrown clear of the vertical joints of the stonework, as shown in detail in Fig. 2.

The tower over the crossing of the church of Notre-Dame-la-Grande at Poitiers and the central tower of the Abbey of Sainte-Marie-des-Dames at Saintes, near Rochefort, both present features of somewhat similar character to the tower at Perigueux, though they are later in style and detail and show considerable improvement in construction. The tower of Notre-Dame-la-Grande is built over a rectangular crossing and consists of two stages surmounted by a circular lantern with a conical roof (Fig. 3). The upper stage is pierced on each side by twin windows, which are sufficiently narrow to allow space for wide, solid masonry on each side for their abutment. The lantern is divided into six panels by engaged columns which ascend to the corbel course of the conical roof and each panel is pierced by twin windows. The manner of treatment of the broaches over the angles of the upper stage shows a great advance from that adopted at St. Front, Perigueux.

At Sainte-Marie, Saintes, the disposition of the tower is somewhat similar to that at Notre-Dame, Poitiers. Here, however, the work is much more elaborate and richly decorated. The stage above the roof line is pierced on each face by arcades of three richly decorated openings. These are of three orders and the inner order being relatively narrow, the clustered piers and responds are of a substantial character. As at St. Front, this stage is covered by a hemispherical vault, but in order to increase the resistance of the angles to the thrusts acting upon them the broaches above are loaded by pinnacles; this again shows an advance in the knowledge of constructive principles. The lantern is pierced by twelve round-headed openings of two lights, each opening being separated by engaged columns as at Notre-Dame, Poitiers, and is covered by a conical roof with a slightly convex surface. This roof has also the scale treatment shown in Fig. 2.

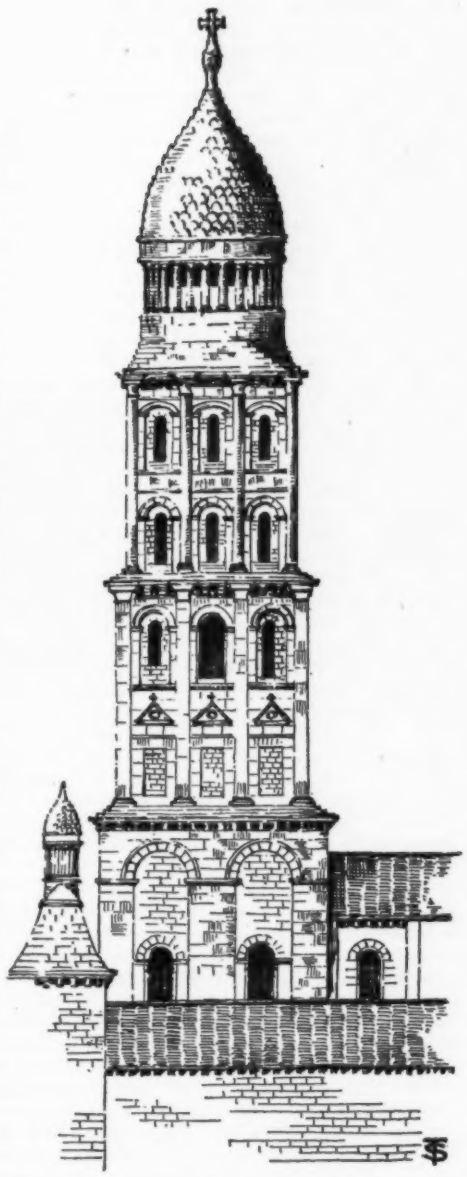


Fig. 1.—Tower of the Church of St. Front, Perigueux.

*M. Viollet le Duc ascribes this tower to the early years of the eleventh century; though Mr. Phené Spiers, in his monograph of St. Front, Perigueux, refers the structure to a period subsequent to 1120. It is difficult, however, to associate the general character of the tower with this later period.

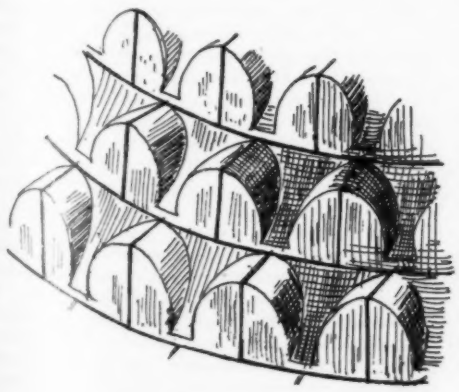


Fig. 2.

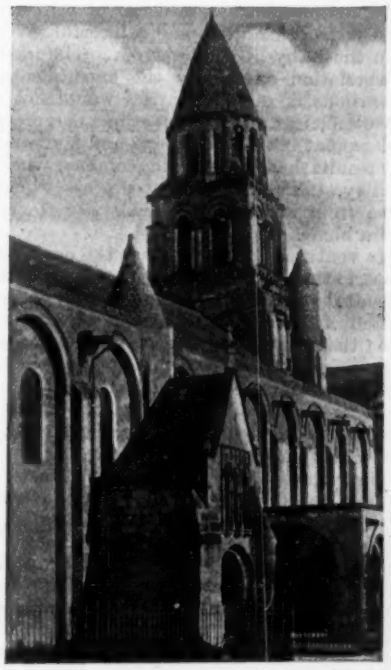


Fig. 3.—Tower of Notre-Dame-la-Grande, Poitiers.

MR. E. STANLEY HALL, F.R.I.B.A. (President), occupied the chair at a general meeting of the Architectural Association held at 35, Bedford-square, W.C., on Monday last.

New Members.

After the Minutes of the previous meeting had been passed and signed, the President announced six nominations for election to membership, and the following were unanimously elected new members :—

F. J. Watson.	E. L. Thompson.
S. L. Thomson.	R. B. Bana.
W. T. Lord.	G. H. H. Heritage.

THE RENEWAL OF VITALITY IN BUILDING.

PROFESSOR A. E. RICHARDSON, F.R.I.B.A. (Professor of Architecture at London University), then gave an address entitled "The Renewal of Vitality in Building," in the course of which he said the first quarter of the twentieth century was nearing its close, and the activities of those who had lived and worked during this exciting time stood clear. There was no need to recount past and current history, other than to make the statement, which they already knew, namely, that newer theories respecting building were, in every country, their own included, finding ready acceptance at the hands of earnest men.

They lived in the present and could not change or affect the present, but they could alter things for the future. That was their right and their duty. It involved a measure of self-sacrifice, a break from comfort, and a forceful severance from the filthy litter of custom. The incentive to emulation offered by the experiments and aspirations of other countries would not alone prove sufficient. Those experiments represented a viewpoint both enterprising and laudable, but the results had nothing in common with this country. The revitalising process would not come from abroad; the task was theirs and theirs alone.

He ventured to suggest that the development of sound theories, both intellectual and scientific, depended upon the schools and coteries of builders trained in the schools. It was his firm belief that England would eventually secure the leadership in all that pertained to the scientific art of building. They had to aim at collective effort as opposed to individualism. They were faced with the realities of modern life, and the whole range of economics. There were in addition such humane considerations as town and regional organisation. They had to consider in their special sphere the sources whence the profession of building drew its sustenance. They needed to pay more attention to technical considerations, and those essential to the comfort and well-being of their fellows. Building was no longer considered to be a matter for idyllistic experiment. It was now looked upon as a scientific art tending more and more to rely on expert knowledge of use and function for articulation. There was, for example, the study of acoustics, which implied the evolution of new forms for auditory chambers, as well as other branches, such as heating, lighting, and ventilation, all of which raised minor issues that in turn affected the scheme. In time civic authorities would draw up regulations whereby the existing by-laws would be augmented by others which would include the control of the main lines of building expression in the streets. Ten years hence this suggestion would be a reality.

As chief builders it was demanded that they keep before them a picture of past and present achievement, not only regarding the narrow limitations of their own calling, but a perspective of reasonable angle, which connoted all the arts; moreover, there was the question of paramount importance—the study of humanity.

The viewpoint to be aimed at was almost beyond their capacity, but nevertheless they should attempt its realisation. Other considerations included the preservation of amenities in town and country, the repair of historical buildings, and the fostering of interest in everything worthy of interest. The precision of modern building methods, particularly the handling of material, had not produced a definite departure from, or improvement on, the aspect of the conventional scenery. The buildings of the present, despite the care of the designer, and the labour of the workmen, were, with possible exceptions, listless and dull. Mere scholarship had not produced the desired result. How, then, could the revitalising process be attempted?

The theory of building was gained in one or other of two ways: to some it was an abstract gift, amounting to intuition, which grasped the idea without effort or inquiry; to others less fortunate it was a question of a study of technicalities, and was attained by reasoning and experience.

Building was an affair of the intellect; primarily the term implied structure, secondly it connoted form, which was the natural outcome of structure, and responded directly to intellectual impulses; the third division was concerned with detail and colour. Structure, form, articulate membering, and colour had collectively and at all times determined the dominant characteristics of building. Those factors, as well as others of a subsidiary nature, had played their part in producing the concrete ideas which in bulk survived, and in all countries formed the conventional scenery, amidst which mankind had lived and moved. On such reasoning could be accepted the idea that building belonged to the intellectual side of human achievement. It was an outward and visible expression of the varied inspirations which from the earliest dawn had possessed mankind.

Gradually through the ages a system had been evolved, subjected it was true to all kinds of cross-currents, but retaining traits of humane significance. From the best of the impulses of the past, brought into being by force of circumstances and the intellectual efforts of nations, had survived ideas both forceful and logical. In that was to be seen the intellectual message projected from remote antiquity to the present, a message concerned with primary ideas and forces, and not to be confused with stylistic renderings.

To-day there was urgent need for renewal of vitality. They had reached a point where it was no longer possible to draw upon the reserve strength of the past to perform present-day functions. This was an age of introspection, with the whole sphere of research open to study and emulation, but they were forced to recognise the very narrow limits imposed on the development of building as a scientific art, if time-honoured methods alone were pursued. Granted the intellectual aspect of building, the need for historical reference as well as considerations both spiritual and emotional, the fact became insistently clear that something else was wanting. What was it? Was it increased technical knowledge? Was it greater proficiency in artistry, or some other factor to add to the complexity of their undertakings?

The truth was that none of these attributes singly would help in the revitalising process. It was impossible to return to conditions that were obsolescent and out of harmony with the newer forces which were daily taking effect. They were gradually becoming accustomed to the thought that their outlook as builders needed broadening. It was a necessity with which they were faced. No longer was it considered good manners to speak of art and art alone; on the contrary, they were confronted with realities which demanded vital expression. Hence the need for a new viewpoint.

All buildings worthy of the name, irrespective of size, style or period, owed their qualities as such to the fact that use and purpose controlled the ultimate form. Structure, therefore, implied the geometrical arrangement of the spaces enclosed and connoted both form and function, horizontally, vertically and in a lateral sense. A building conceived on those basic principles, which had their origin in the beginning of things, was beyond question an intellectual achievement. It was structurally sound and functionally articulate in direct ratio to the statement of the plan formation.

The geometrical arrangement of the plan, with its nucleus and appendages, its circulation and conveniences, its voids, solids and vistral effects, each and several, made up the articulation of the structure. There were considerations of support and distribution, the legitimate use of materials, the calculation of mechanics, and other factors, all of which needed control if they were to be employed to assist the general effect. It was not possible for the architect, as a preliminary, to do more than marshal these latent forces in correct order; but an observance of such elementary factors would do much to produce a complete building.

The architect had, therefore, to follow the axiom that function and use were the factors which conjointly determined structure. It was a law present in all good building, irrespective of traditional usage. The more closely that law was observed the better the structural articulation and in varying degree the intellectual status of the building expression.

Form was the true manifestation and reflection of structure. The experiments of the nineteenth century, and after, illustrated the growth of complexity, in the main muddle-headed; a sort of unsuccessful groping after the secret of building through the manifestations and examples of form without sufficient and searching inquiry into the nature of function. While on this point the idea could be advanced that the primary theory of use and function allowed of licence, such as the flowering o detail, membering and decoration, the main structural attributes remaining intact and insistent. The designer who aimed at the true secret of building was one who was gifted with the instinct to rely for strength and ultimate effect on the inherent structural attributes of the fabric. The pre-classical civilisations in a great measure produced buildings of vast scale, representative of religion and military routine. They were not of high intellectual value. It was as though myriads of insects had been at work listlessly and without inspiration. The universal law of form in building arising from structural necessity and usage was common to all art. It was a law that brooked no interference; in the realm of building it had ever been present, and crystallised the intellectual impulses and culture common to any branch of art. If that law were ignored, building descended to the level of mere decoration; it lost its vitality and reason to be. Then the cross-currents of style, exploitation, and experiment in fantastic shapes took effect, the result being a species of Babylonian confusion. Building, of all the arts, relied primarily on the faculty of reasoning, which was the basis of design.

Buildings of European origin, from the age of Pericles to the latest examples of the Renaissance in the United States, in the main expressed the cool calculation and intellectual grasp of the building theory of function, combined with a dominant taste for decoration. The monuments of pre-classical days and later, in the East, from Assyria to India, appeared to have arisen in response to impulses that decreed

form to be more important than structure. The buildings of India in particular which to-day were receiving considerable attention from architects had no structural vitality. The silhouette and the form of the exterior represented a piled-up mass of material, interesting as abstract forms, but still-born in every other respect. They were creations stupendous in idea, but devoid of the vital spark. It was a style which had for its dominant expression the cult of cruelty and the subjection of humanity and individuality—a creed eloquent of the Hindoo religion and spiritual outlook. On such reasoning it must be conceded that the structural quality was vital to all building and sustained development of art. It was no longer possible to return to primitive ideals or to revert to primary forms, neither was it expedient to attempt, as heretofore, to exploit stylistic tendencies. Building as a living and vital art to-day had almost ceased to breathe. It had scarcely any reserve strength, and was at the mercy of every whim and fashion. They were seeking to escape from that species of *cul-de-sac* into which the thought of two continents during the past century had diverted action. Among the many difficulties which beset them as builders was the fact that, apart from the necessity of building well and structurally, none recognised that a compelling interest was at hand to assist. The Greeks had the development of intellect as their ideal, the Romans had the lust of power, the Byzantine Greeks the impelling force of fusing eastern and western thought, the mediævalists the spiritual influence of religion, the artists of the Renaissance the revival of classical thought, which began in the fifteenth and lasted until the opening of the nineteenth century. The development of scientific research in the nineteenth century swept aside all idealistic leanings; the arts were relegated to a minor place; hence the furtive, but not quite abortive, revivals which in every country practically followed the same course.

Form, as understood, and culled from historical *motifs*, was forced to envelop structural arrangements, much as an extinguisher was placed over a candle. They were just beginning to apprehend the effect of that disastrous policy, which was not confined to practice in this country alone, but was the heritage of France and America. They were all guilty of the practice. Many beautiful buildings had resulted from such introspective study of the past, but that which appeared correct in the days of Sir Joshua Reynolds, and later of Cockerell, Pugin, Scott, and Ruskin, would afford little assistance at this crisis, when the need was delivery from the maze in which all the aspects of building were ensnared.

There were those who thought that the war would have swept away the old shibboleths, and that a new heaven and a new earth would be ready for enjoyment. Others opined that an expansion of commerce would provide the avenue for improvement in building matters, and yet others thought that salvation would come from America. The old habits and the slipshod methods had with few exceptions been followed; it had been a policy of despair, especially for the hackworkers and the journeymen. The issue before architects to-day was the definite one of studying and interpreting realities. The impelling interest was present; it had ever been present, although shadowy and scarcely realised. What was it? It was the interest of humanity, the study of one's fellows, whose needs, ambitions, emotions and struggles demanded assistance and comfort from the arts. Close and careful experiment with old forms and models might lead to a perfection of what was already known regarding stylistic expression; but the results were doomed to be soulless and unintelligible to the mass of opinion. What should they think of a painter who deliberately affected the style of Reynolds, Romney or Masquerier, other than to gain knowledge of technique? Yet architects in every country appeared to be content to strive after the shadow and to lose the substance. No past *motif*, however pleasant as building, or detail, could be accepted as the basis of a modern departure. It was structure and structure alone that would provide the germ of the new style, which, after all, was a very old one. Their intelligence should, therefore, be directed not to the theory of form, but to the theory of structure, of use, function and necessity. The minor attributes would take care of themselves. Theirs was the task to rescue the scientific art of building from foundering in the slough of ineptitude, to which the art had been led by over-observance of complex conditions. This was not the time for historical essays in material, however brilliantly conceived and executed; no paper facility would atone for lack of vitality and unobservance of structural necessity. The need of the moment was for a creative impulse based on present-day wants, having as its purpose the control of conditions that were fast becoming chaotic—more chaotic and perplexing than they were a century ago.

Foreign attainment and advance must be noted and weighed. There was plenty of scope for individualism, but individualism was dangerous; in like manner, the pursuit of idealism for the sake of spectacular effect must be curbed. Building must be studied by coteries of specialists with the end in view that vitality of expression was desired, closely representing the finest aspects of every-day life. Art must be entered upon on the big scale; no pains or time or expense could be spared. It must be understood that building embraced many crafts, that mere precision in the handling of materials would not produce the desired result, and that individual genius alone would not suffice to bring about the change. Again he would make the allusion to the value of schools and coteries as opposed to the isolated efforts of talented practitioners, whose time was rightly given to their individual work.

The architect who relied on form alone to express his ideas did not succed in producing results that were convincing. In general he sought to obtain interest by increasing the complexity of the detail and minor parts. But buildings that were entirely satisfactory were not produced in that way. No good could accrue if the latent forces were ignored. It was not a matter of richness of surface or scenic effect, but of the expression of the fundamental shaping of the building horizontally, vertically and laterally, having in view the articulation of the innumerable forces which were latent in every part of the structure. The addition of ornament, meretricious or otherwise, unless it were devised with the greatest care, would only confuse the issue. Detail that was studied and bookish would not assert the ultimate expression of use and function. If it were employed for pictorical effect it would only act as a delusion and a snare. In this country for over a century the making of books and the pursuit of research, with the building up of an almost incomprehensible repertoire of style knowledge, had obscured the finer vision of architects to the intrinsic merits of structural evolution.

It appeared as if present-day designers were handicapped by a chronic ineptitude for dealing with present realities. Once this simple truth were realised building would advance with renewed vitality and spirit.

What was wanted at the present moment was an entire reconstruction of the body of building; nothing else would suffice. Fine as the European tradition was, with its many excellent examplars of form, it had been found by experience to be closed to expansion; in other words it had reached the conventional limits imposed by the observance of the classical forms, which underlay its manifestations. They were bound, however, to observe certain of the laws which past achievement had made clear. It was not possible to discard them altogether, but it was equally certain that English builders and artists could no longer submit to the tyranny of the Mediterranean.

The fault of the building work of to-day was that in the main it bore no relation to everyday conditions. At its best it was scholarly to some degree, but it was contradictory: it was a law unto itself, but outside its sphere of action it was not understood. The public were in doubt as to what the parade of knowledge meant; hence the perpetual reactions and changes made by designers to achieve fashionable notoriety. True building, that was to say the observance of the theory of structure, should be above the tendencies and fashions of the moment; it must be neither vague nor dazzling; on the contrary, its message should be one of clarity. Until modern building regained the quality of articulation, until the idea of use and function became accepted as the only means whereby definite expression could be gained, all talk of a new style was so much nonsense. Buildings must have something to say, but the lesson should be definite: there must be the expression of purpose combined with spiritual impulses, the finesse of artistry and the rays of logic. The English character was the finest of its kind in the world, but English builders appeared to have lost, let it be hoped temporarily, the power to express that character. They had been too self-sufficient, too confident, too inadequate altogether to rise above worldly surroundings. Some had thought that interfusion and association of past ideas would be productive of great results. Such thoughts had been proved fallacious; they had seen the effects of such ill-advised doctrine in recent works in the streets of London—a greater complexity and muddle-headedness.

Revitalised building would depend entirely on the handling of the definite principle of structure, which in turn would draw its support from the logical employment of materials. In that way, and in that way alone, would the correct articulation of structural forms assist the evolution of a humane style of building, one answering the needs of the moment and worthy of being handed on to posterity. Fantasy or external novelty should be avoided. The realisation of a perfect building was no chance affair; no trick of draughtsmanship or artistic skill, no bookish lore or apish copyism of foreign ideas, would effect the desired result. Clarity of articulation was the only way, and the principle of intellectual penetration must be adopted. Architects had created a wall that shut out the public, and from behind that fastness they threw out ideas that had no reality in the world of facts. No progress was possible in that way; it was a mediæval method, one entirely unrelated to the world in which they lived and moved and from which they drew their means of living.

Too long had they pursued form for form's sake, too long had designers bowed down to the dictates of ephemeral and transient fashion, the result being that building had lost its grip on the majority of the audience. There was something deeper to be striven for than mere decoration; it was concerned with the instinct of man to touch upon the mysterious and the spiritual. If they looked around at recent buildings, the manifold evils of the pursuit of form irrespective of cool calculation of the exercise of the reasoning faculties were clear to the view. The attributes of present building appeared to be surface show, and inside confusion. There was no joy in such works, no spiritual expression, no exultation over structural victories, no attempt to make use of the latent forces inherent in upstanding materials. The stonework was laid with precision, the bricks were sound, the carving and ornament applied regardless of expense, but it was apparent that the men employed on the work had imbibed the listlessness of the paper creation from the architect's board. It is all very clever and touching, but it was not convincing. Neither designers nor artificers had succeeded in conveying a message.

Discussion.

Mr. Robert Atkinson, Mr. H. S. Goodhart-Rendel, Mr. K. N. B. Cross, Mr. Manning Robertson, Mr. H. M. Robertson, and Mr. W. J. Benslyn took part in a discussion which followed the paper, and a hearty vote of thanks was accorded to Professor Richardson.

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ILLUSTRATIONS.

Cambridge University: School of Bio-Chemistry.

We give this week further illustrations of the School of Bio-Chemistry, Cambridge University, of which Sir Edwin Cooper, F.R.I.B.A., is the architect. Other illustrations of this building were given in our last issue.

The woodcarving shown in some of the illustrations was executed by Mr. George Houghton.

Municipal Auditorium, Colorado Springs, U.S.A.

This building is primarily meant for the holding of conventions, the arena and balcony portion being for the large, and the three side halls for the small, conventions. In addition, it will serve for public meetings, orchestral concerts, and musical recitals. Space is provided on each side of the proscenium arch for an organ, and the arch is treated with perforated work for the emission of the sound. Chair storage is provided, so that the arena can be cleared for basket-ball games and exhibitions of various kinds.

The total seating capacity is 2,920; and the side halls seat 305, 255 and 90 respectively. The construction is fireproof throughout. The exterior walls are faced with light grey brick, and the stonework is of light buff Boise sandstone. A complete fan system of heating and ventilation has been installed, the fans being placed on the upper floor at each side of stage. In the ceiling of the arena has been installed acoustical felt, and the results are unusually successful. The cost of the building was £67,200; and it was completed in June, 1923.

The design and supervision of construction were by Messrs. T. MacLaren & T. D. Hetherington, and the working plans were made by Mr. C. E. Thomas.

No. 29, Weymouth-street, London, W.1.

This house, which was designed in 1914, but which, like other work on the Howard de Walden Estate, was held up owing to the war, is being built for Sir Walter Lawrence, J.P. The building is fronted with Portland stone, and the illustration was exhibited recently at the Royal Academy. In execution one of the bay-windows has been omitted in order to allow of one larger bay being constructed.

The architect is Mr. George Hornblower, F.R.I.B.A.

Barry Club.

The sketch design on p. 113 was presented to the Club by a member of the Committee, to enable it to see the accommodation that can be put on to the site of the present premises of the Club, and the site of the adjoining premises, which will be acquired. The gymnasium on ground floor will be used as a hall for lectures and entertainments. The basement has a dark room and skittle alley. The first floor has games rooms, and billiard room (over the gymnasium), which contains six tables. The second floor contains the caretakers' quarters. The building will be erected when funds permit. The design is by Mr. J. A. Hallam, M.T.P.I., Deputy Architect of the Welsh Town-Planning and Housing Trust, Cardiff.

MEETINGS.

MONDAY, *January* 21.

Royal Institute of British Architects.—Mr. P. E. Nobbs on "Architecture in Canada." At Burlington House, Piccadilly, W. 1.

WEDNESDAY, *January* 23.

L.C.C. Central School of Arts and Crafts.—Sir Banister Fletcher on "Ancient Rome." At Southampton-row, W.C. 1. 6 p.m.

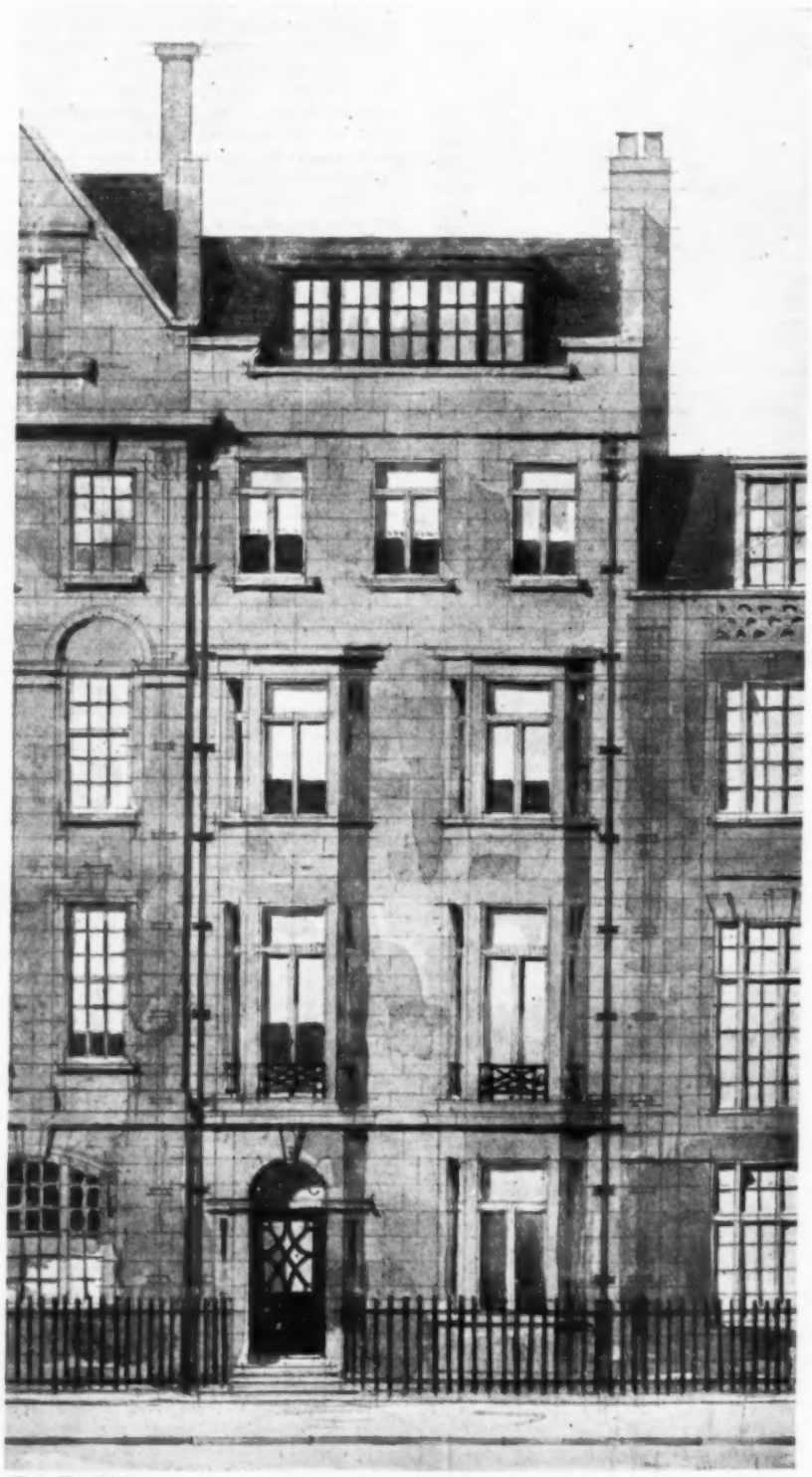
THURSDAY, *January* 24.

Society of Antiquaries.—Mr. R. A. Smith on "Examples of Anglian Art." At Burlington House, Piccadilly, W. 1.

Architects' and Surveyors' Assistants' Professional Union.—Annual General Meeting of the Metropolitan Branch. At Caxton Hall, S.W. 1. 7 p.m.

Institution of Structural Engineers.—Presidential Address by Major J. Petrie. At 296, Vauxhall Bridge-road, S.W. 1. 8 p.m.

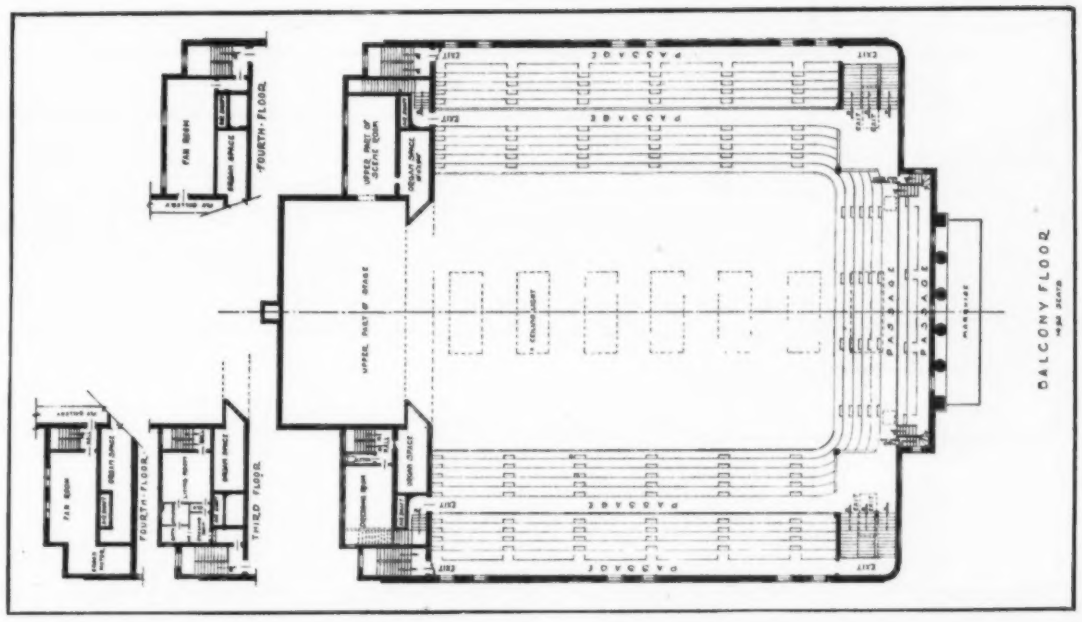
Leeds and West Yorkshire Architectural Society.—Annual Dinner.

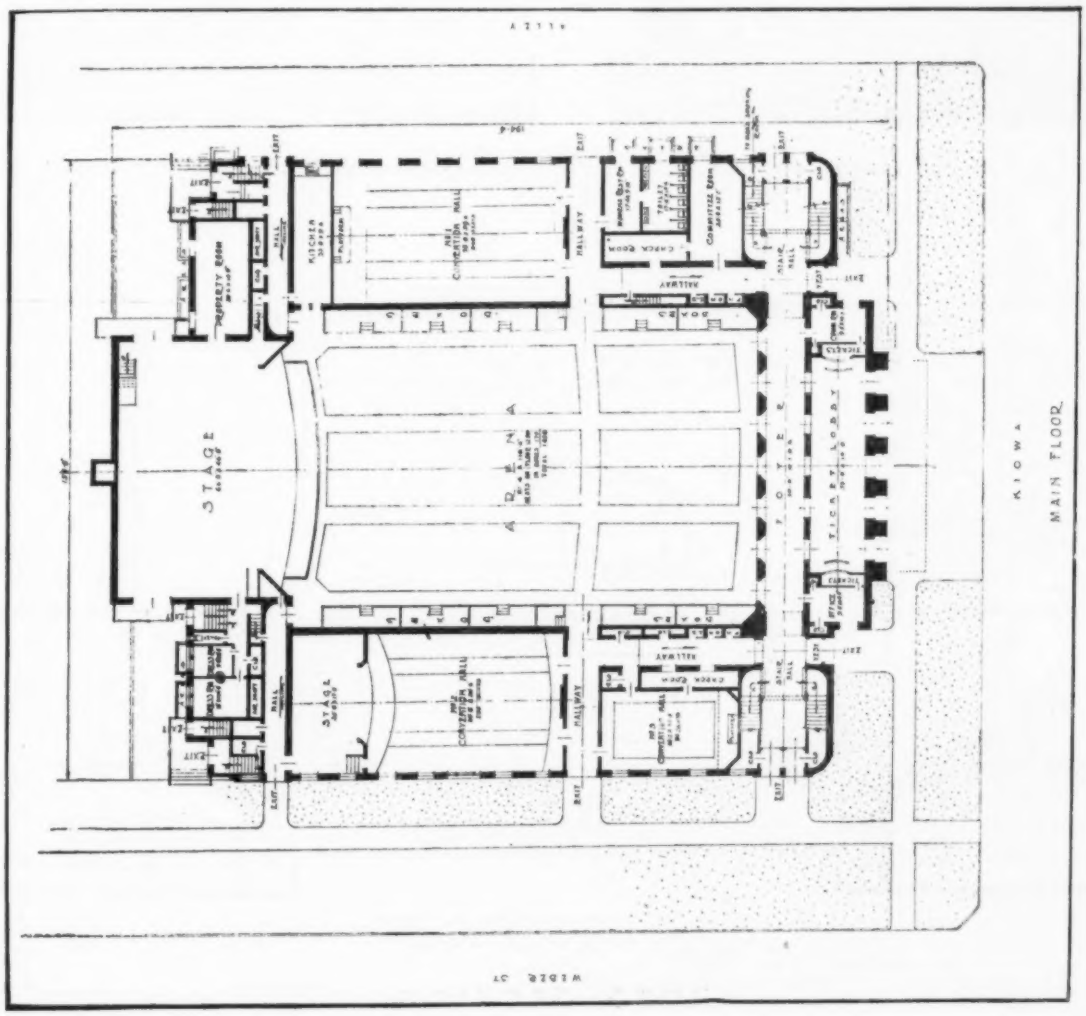


R.A. Exhibition.

No. 29, Weymouth-street, W.1.

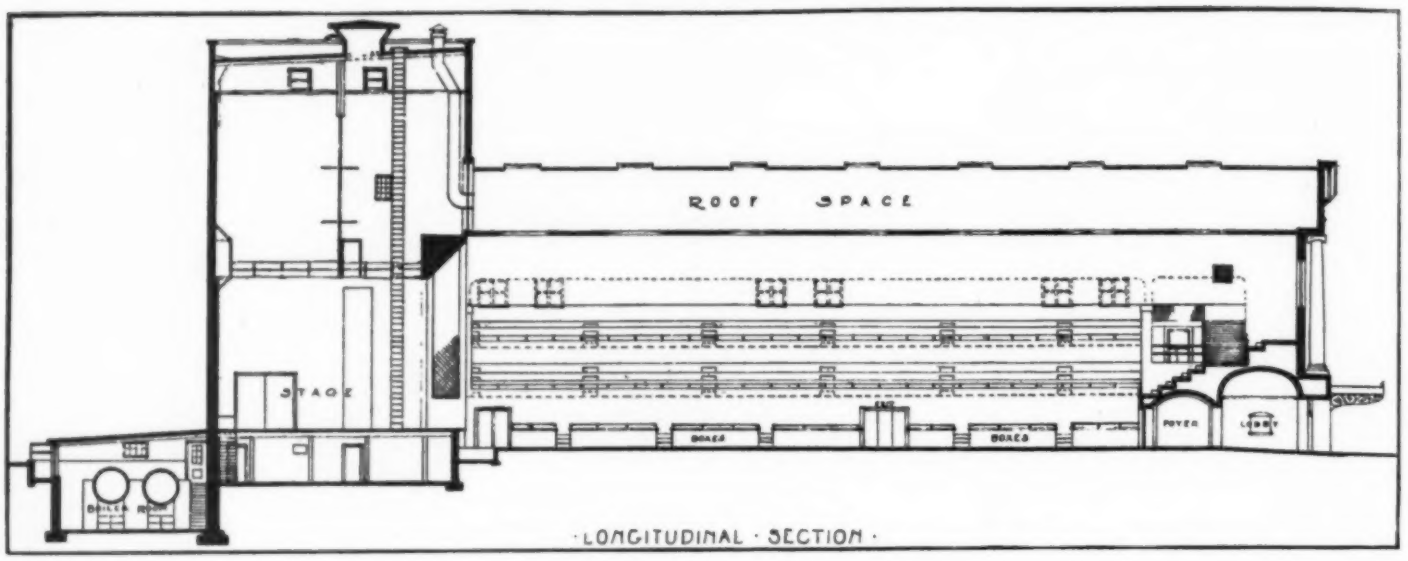
MR. GEORGE HORNBLOWER, F.R.I.B.A., Architect.

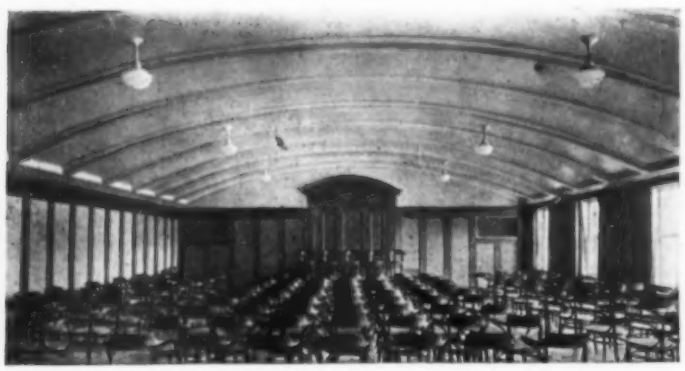




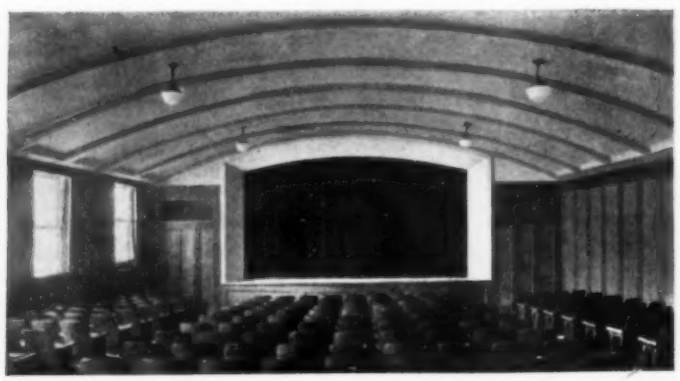
Municipal Auditorium, Colorado Springs, Colorado, U.S.A.

Working Drawings by Mr. C. E. THOMAS. Design and Supervision by MESSRS. T. MACLAREN & T. D. HETHERINGTON.

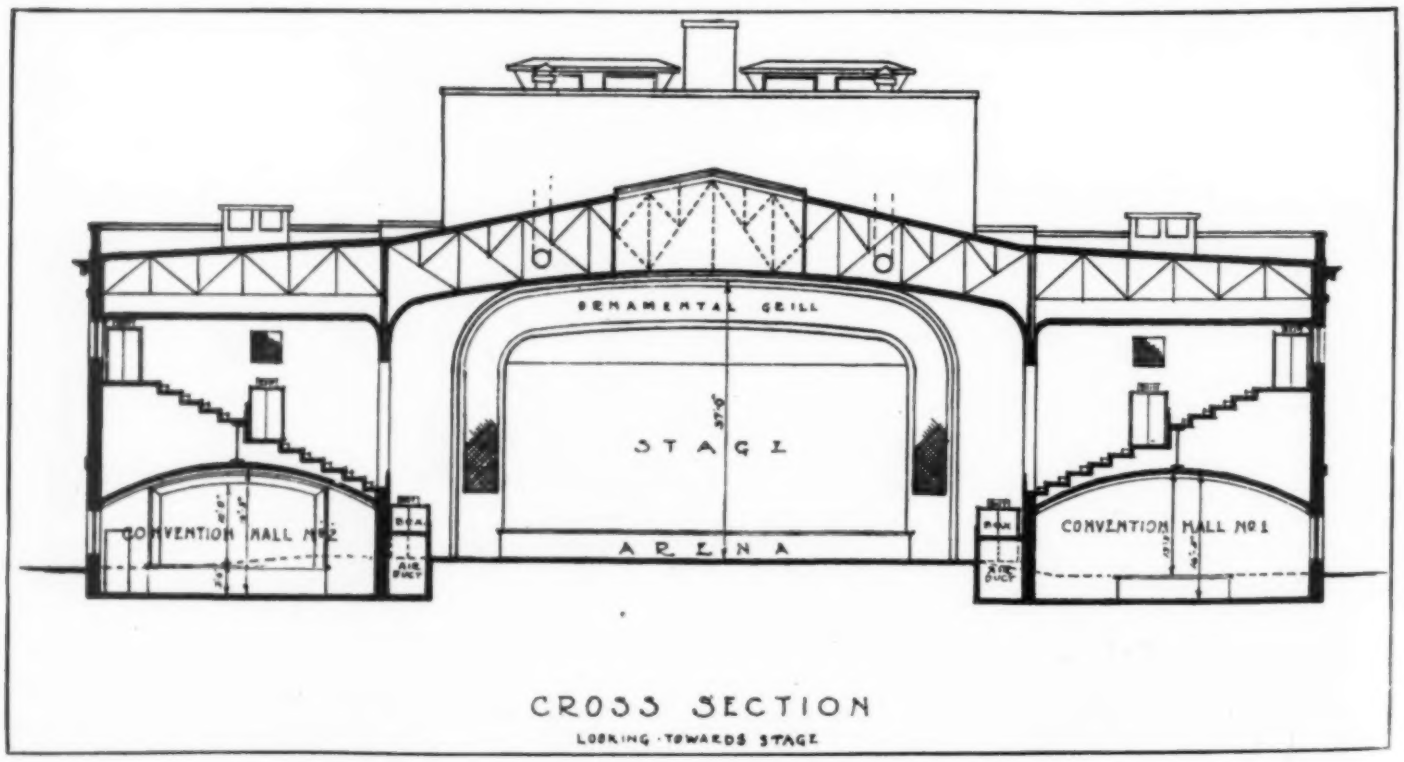




INTERIOR OF NO. 1 SMALL CONVENTION HALL.



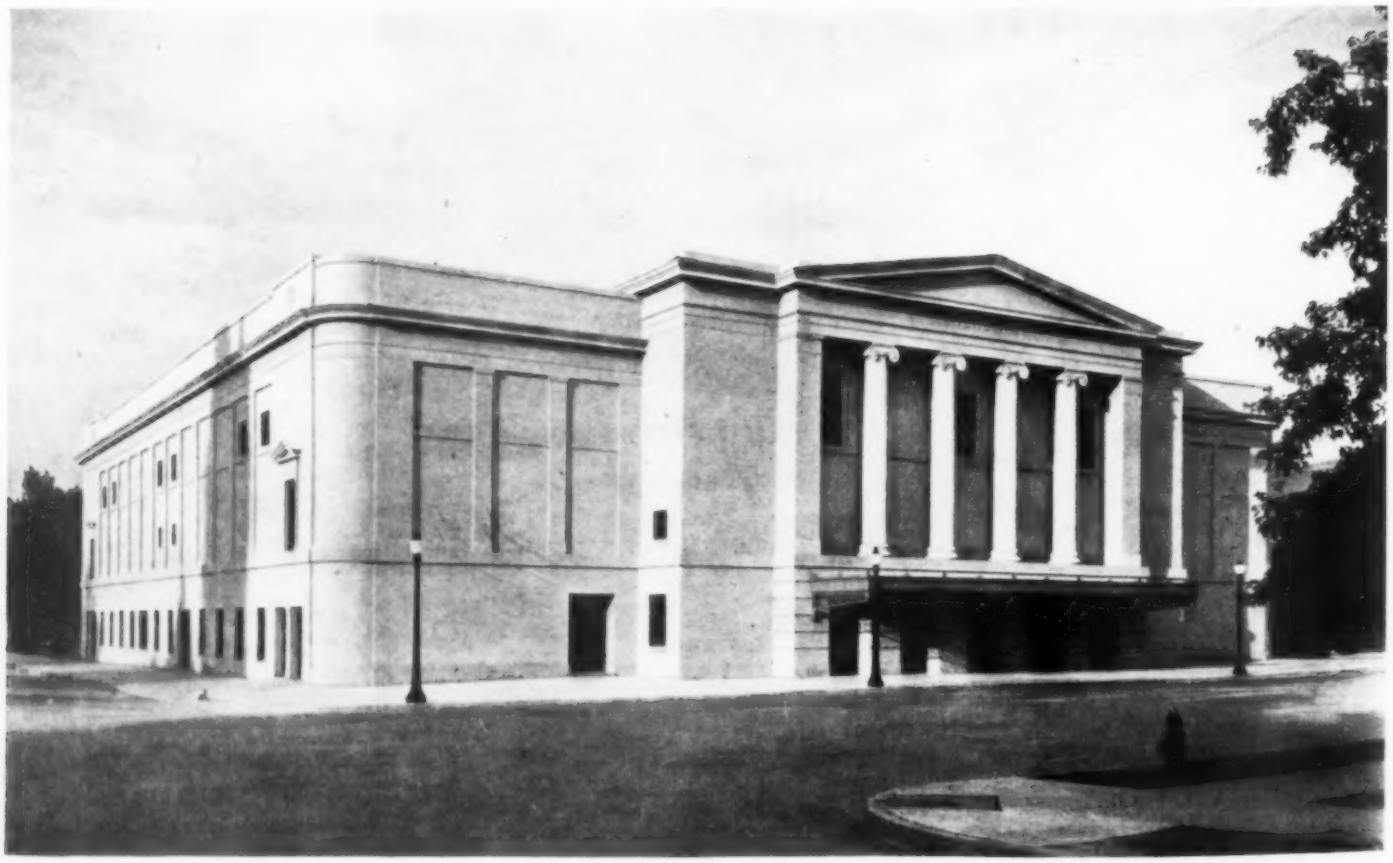
INTERIOR OF NO. 2 SMALL CONVENTION HALL.



Municipal Auditorium, Colorado Springs, Colorado, U.S.A.

Working Drawings by Mr. C. E. THOMAS. Design and Supervision by MESSRS. T. MACLAREN & T. D. HETHERINGTON.

INTERIOR.

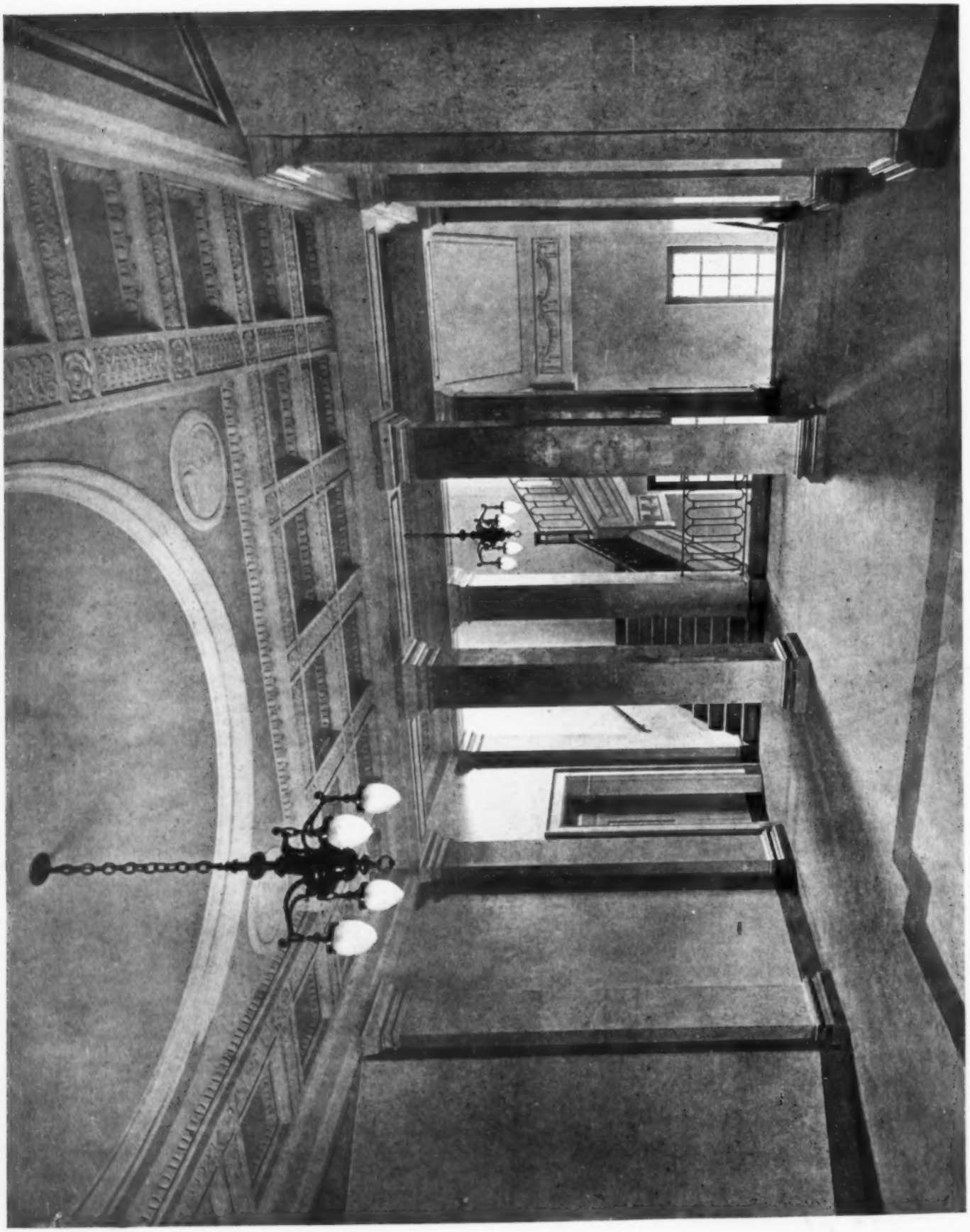


GENERAL VIEW.

Municipal Auditorium, Colorado Springs, Colorado, U.S.A.

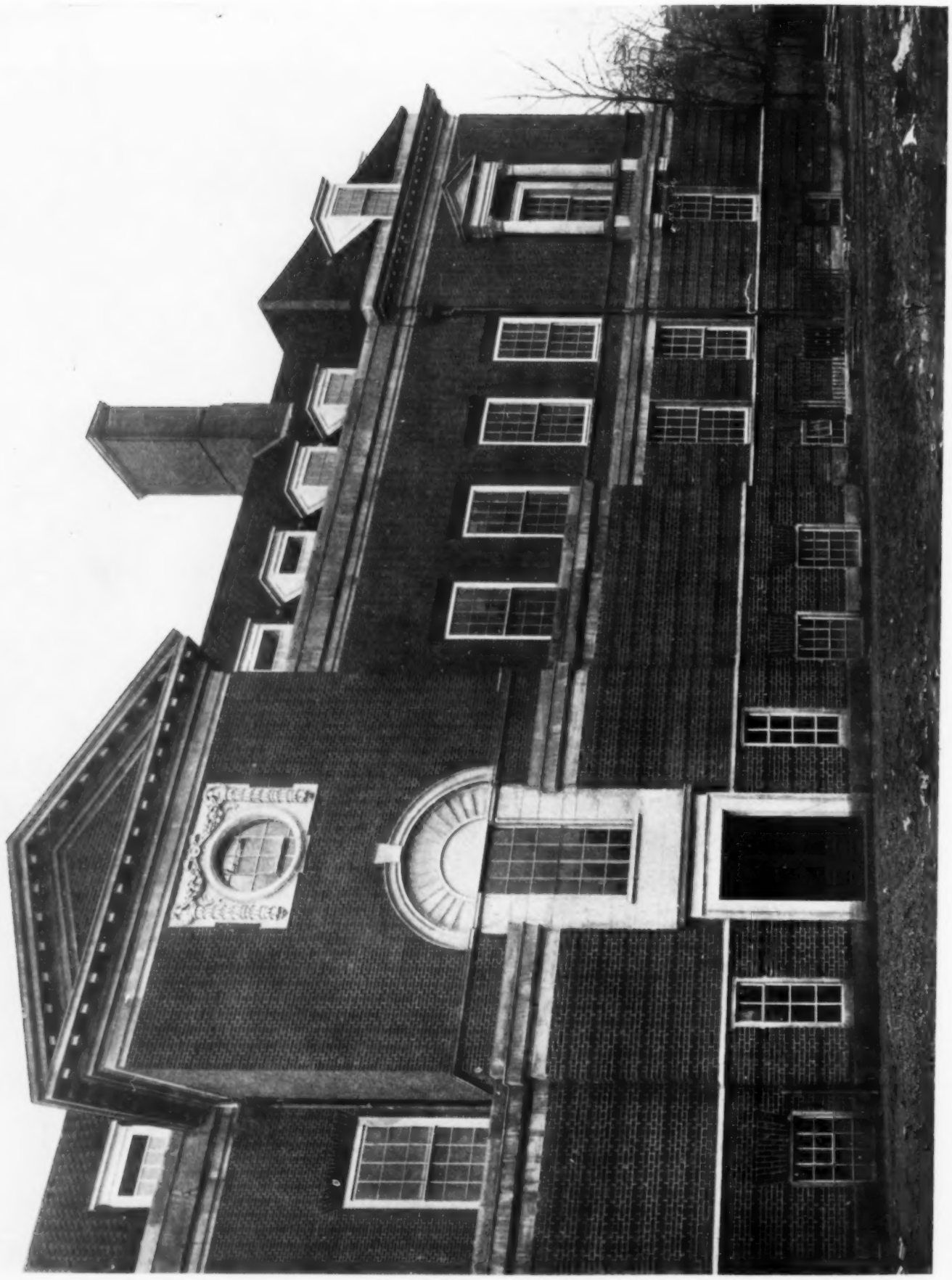
Working Drawings by Mr. C. E. Thomas. Design and Supervision by Messrs. T. MacLaren & T. D. Hetherington.

UNIV. OF MICH.



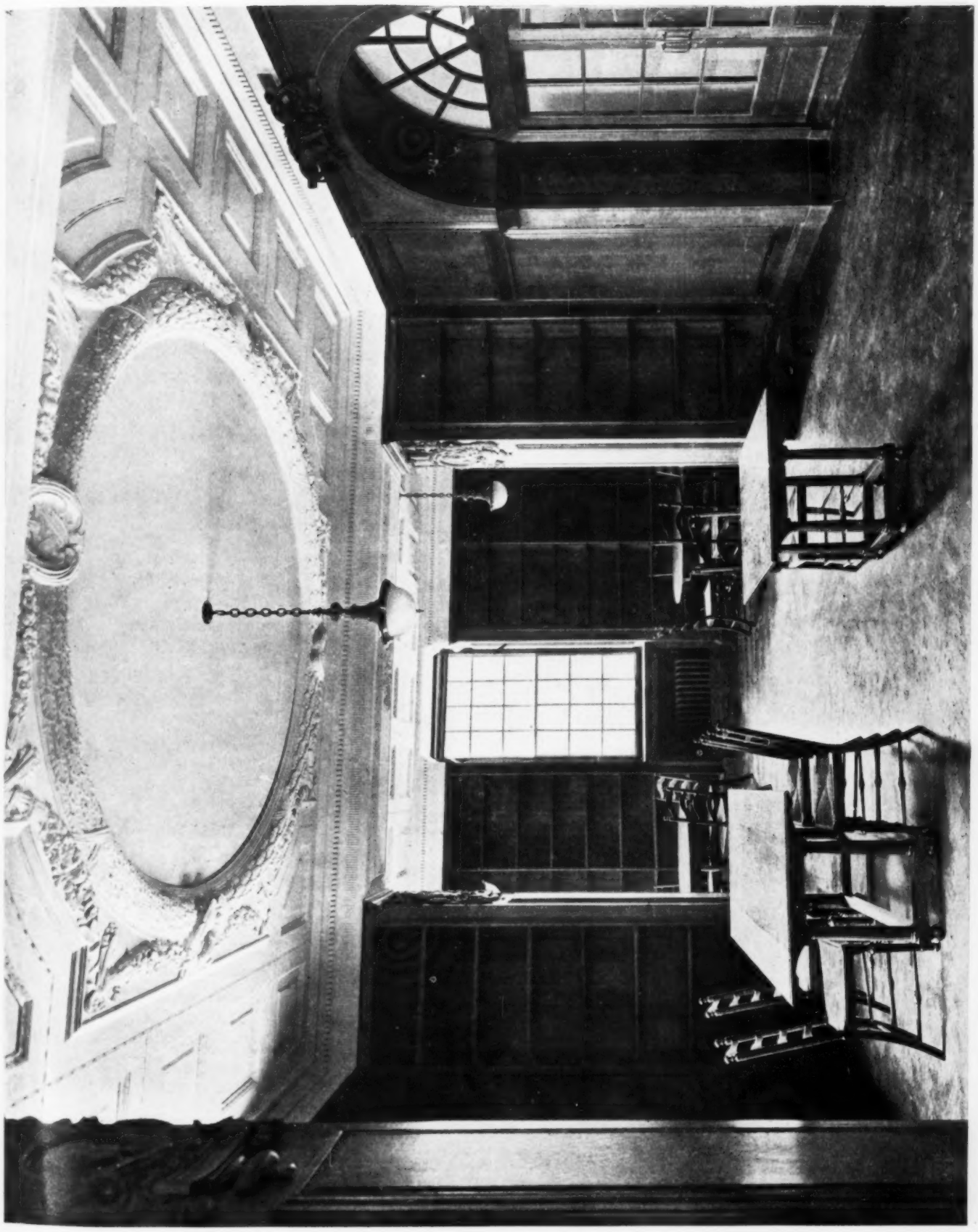
FIRST FLOOR LANDING.

Cambridge University: School of Bio-Chemistry. Sir Edwin Cooper, F.R.I.B.A., Architect.



VIEW FROM THE QUAD.

Cambridge University: School of Biochemistry. Sir Edwin Cooper, F.R.I.B.A., Architect.



THE LIBRARY.

Cambridge University: School of Bio-Chemistry. Sir Edwin Cooper, F.R.I.B.A., Architect.

UNIV. OF MICH.

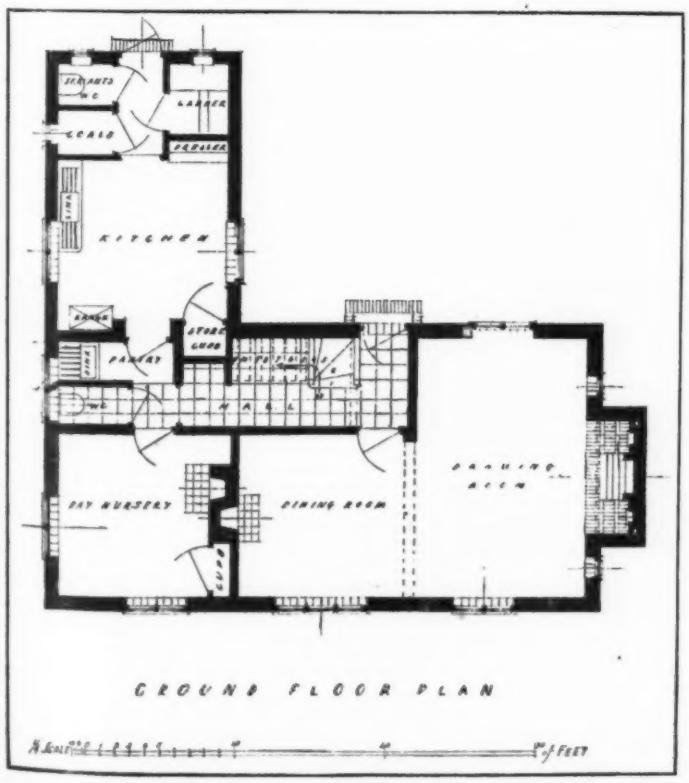
THE COMMON ROOM.

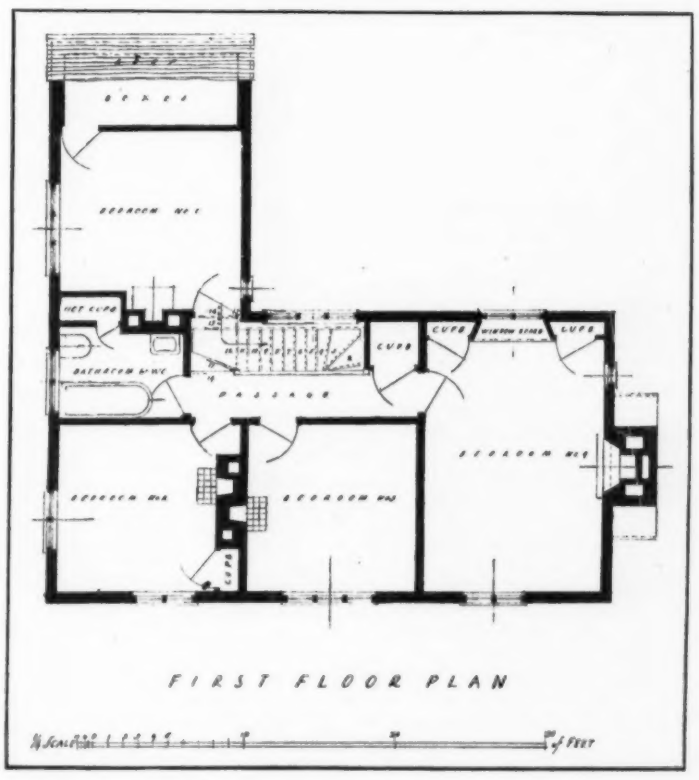
END ELEVATION.

Cambridge University: School of Bio-Chemistry. SIR EDWIN COOPER, F.R.I.B.A., Architect.

UNIV. OF MICH.

R.A. Exhibition, 1923.





Cottage in East Sussex.

Mr. A. B. Llewelyn Roberts, A.R.I.B.A. (Messrs. Collcutt & Hamp), Architects.

UNIV. OF MICH.

ST. PAUL'S CATHEDRAL.

PROBLEMS OF REPAIR.

FOR several years past the structural condition of St. Paul's Cathedral has been the subject of inquiries undertaken by the Surveyor to the Fabric—Mr. Mervyn Macartney—and latterly by a Commission of architects and engineers appointed by the Dean and Chapter to advise with him upon the best methods of repair. From time to time a certain amount of information is published in connection with appeals for funds for the maintenance of the building, but the full report of the Commission is still a matter for the future to reveal. In the meantime, and in preparation to receive their report with intelligent appreciation, it is well to examine the broader aspects of the difficult problem the conservators have before them. St. Paul's Cathedral is the record of a life's development as well as a life's work.

Sir Christopher Wren at the end of a long life, his mind stored with the accumulated experience of a thousand experiments in building science, stands for all time pre-eminent as the inventor of sound structural expedients. What the great Brunelleschi had done with an extraordinary complexity of ribs and panels—still incomprehensible to most observers—Wren achieved by means so direct as almost to disguise with their very simplicity the wit that created them.

Compared with the lightness and buoyancy of Wren's design the work of Bramante and Michelangelo at St. Peter's looks heavy and inarticulate, and it seems extraordinary that Wren, this man of infinite capacities, should have been guilty of obvious faults; this mathematician be out in his calculations, this antiquarian commit the structural blunders that the ancients, whose records he studied, had succeeded in recognising and finding means to avoid.

But Wren, a young man already famous at thirty-four years of age as a theoretical and experimental scientist, was not yet a practical builder, nor can he have been well acquainted with the hundred and one difficulties of builder's work which may be solved in the light of experience or which determine themselves without any exact solution by the unconscious processes of established routine.

Wren's friends forced him to turn his attention to building, and building on the greatest scale yet seen in England at a time when his experience in this special class of work was practically nil. Nor was the time altogether favourable to a young man about to study the problems of practical construction. Church building on a large scale was a thing of the past, the Gothic manner of constructional architecture discredited, and the information concerning the fashionable architecture in process of introduction from Italy concerned itself, as Wren himself has left on record, rather with the proportions of orders and mouldings than with the abutment of arches. Science, in its infancy, was with difficulty struggling out of its swaddling clothes of superstition; astrology, and magic art and conditions were such as threatened to breed disaster rather than success. What might have been called a young man's rash presumption in undertaking to build a gigantic Cathedral with less practical experience than would be needed to encourage most of us to venture upon the erection of a humble cottage has been shown by the success of the experiment to have been not rashness, but wise confidence in his own resources. Wren's work at St. Paul's is none the less an experiment in the self-expression of an architectural giant and bears the impress of its experimental character in all its parts.

Throughout the great work Wren continually found himself called upon to take risks and adjust the conflicting claims of the ideal and the actual. His favourite design, admirable in its structural congruity, he was forced to abandon, and in regard to the expedients of building construction to be employed in commencing work upon the approved design, he seems to have consented at first to the use of the normal methods of his time without designing improvements of his own, though exercising surprisingly mature discretion and common sense. It was in the higher parts of the building that he exploited his own constructive skill, his inventive powers increasing with his difficulties. His estimate of the bearing capacities of the pot earth foundation now seems to have been slightly at fault. He was optimistic, and existing evidence of sliding and sinking on the foundations must be taken into account by the conservators, as well as the possibility of future movements resulting from the same cause and from the aggravation of it by the demands of modern life, such as the drainage of the subsoil for the formation of deep basements, sewers and underground railways, and the vibration caused by heavy traffic. Had Wren commenced the foundations after the full attainment of his great knowledge he might perhaps have exercised more caution, but in that case his Cathedral might never have been built.

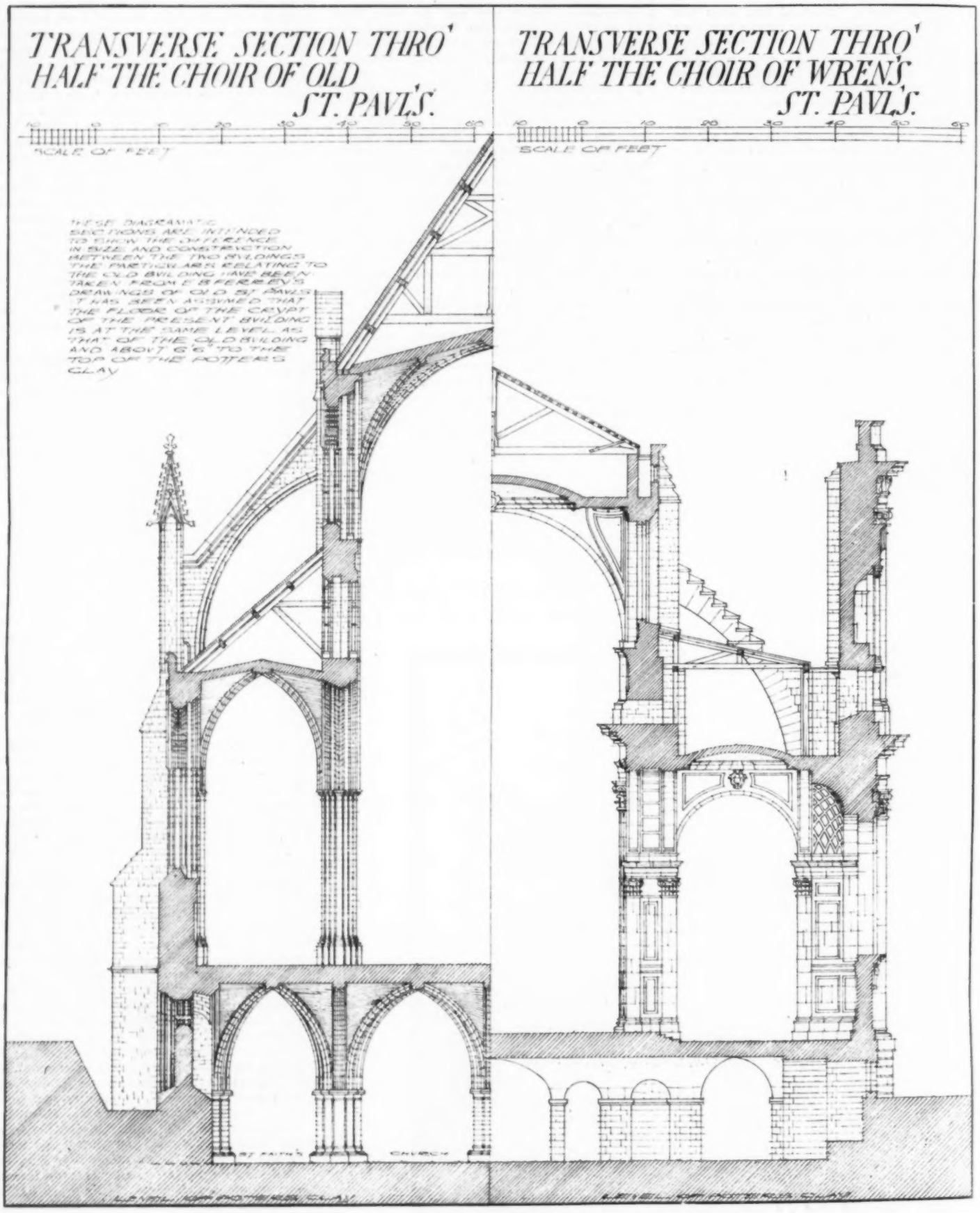
The cost of taking down the foundations to a sure depth would have been enormous both in time and money, and patronage might have been frightened at the prospect. It will be interesting to learn by what method it is proposed to restrain the slight though general movement of the building to the south-west and the particular subsidence of one of its eight central piers towards the north-east. Another main defect which will demand careful attention is the inward lean and bulge of the eight central piers overloaded and eccentrically loaded by the weight of the drums and their load of cone and inner and outer domes. Examination reveals the fact that the substance of these piers has been racked apart in long, slanting lines by fractures extending from points near their inner edges at their tops to points near their outer edges at their bases. Stresses are so great as to make repair both hazardous and difficult, for, in removing any stone, however defective and useless it may appear to be, a risk is incurred that adjoining stones, hitherto sound, will be split by the transference to them of more pressure than they can safely bear.

A sound method of repair will involve the provision of a substantial and convenient temporary staging to support the great weights, and a well-devised scheme by which the weakened piers can be made strong once more. The composite nature of the piers with an internal core of rubble enclosed in a skin of ashlar of varying and uncertain thickness, the whole shattered by the eccentric load, presents a special problem, and the part of the Commission's report dealing with it should provide an intellectual treat to all acquainted with the difficulties of the case. A brilliant solution is demanded, for nothing short of the highest efficiency will suffice to preserve the building or avoid grave danger to those concerned in the operations of repair.

The dislocation in surrounding parts of the building consequent upon the subsidence of the central piers raises an artistic as well as a constructional question. It is extremely improbable that any proposal to jack up the arches and the domes to their original level will be made or put into effect and, failing some such process, the lines of moulding and cornice will continue to dip more or less abruptly at the points where the lightly loaded portions of the building abut upon the central and heavily loaded parts. A certain amount of movement will continue in this zone whatever measures are adopted, and spalls of stone are liable to fall from time to time when heavily loaded masses tear free from lighter masses, or grind past them in further unequal settlements.

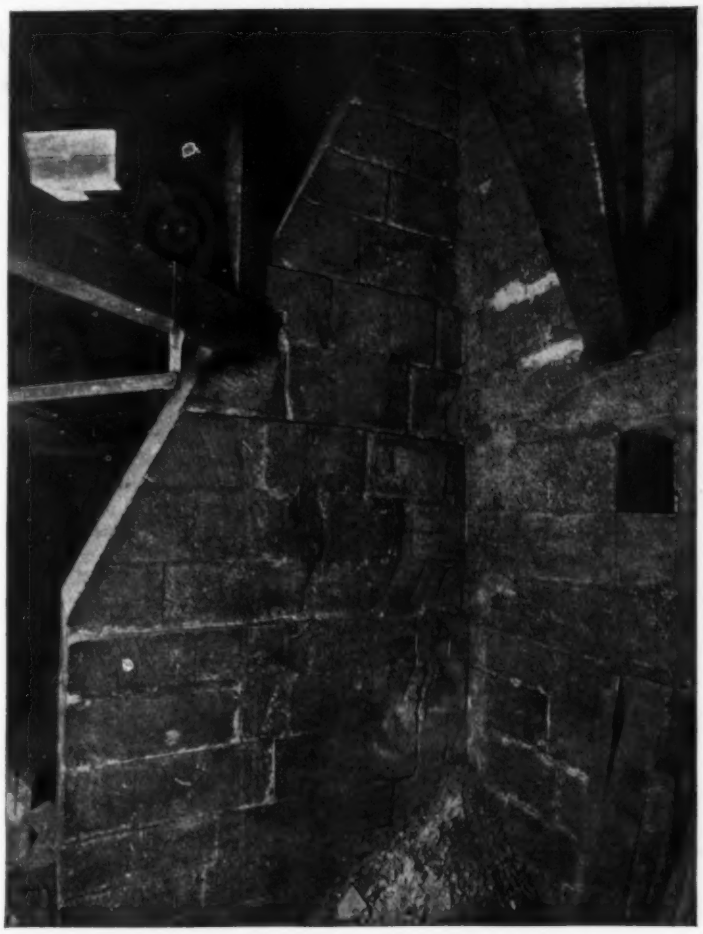
Suggestions have been made in the past for spreading the central load upon a broader basis either over the outer parts of the eight piers or by a still more extended scheme over the surrounding piers and bastions. The presence or absence of any such proposals in the Commission's Report and the technical details of

First Draft for an Explanatory Diagram Showing Component Parts of the Cathedral.


TRANSVERSE SECTION THRO' HALF THE CHOIR OF OLD ST. PAUL'S.
SCALE OF FEET
THESE DIAGRAMATIC SECTIONS ARE INTENDED TO SHOW THE DIFFERENCE IN SIZE AND CONSTRUCTION BETWEEN THE TWO BUILDINGS. THE PARTICULARS RELATING TO THE OLD BUILDING HAVE BEEN TAKEN FROM E. BASIRE'S DRAWINGS OF OLD ST. PAUL'S. IT HAS BEEN ASSUMED THAT THE FLOOR OF THE CRYPT OF THE PRESENT BUILDING IS AT THE SAME LEVEL AS THAT OF THE OLD BUILDING AND ABOUT 6'6" TO THE TOP OF THE POTTERS CLAY
TRANSVERSE SECTION THRO' HALF THE CHOIR OF WREN'S ST. PAUL'S.
SCALE OF FEET

Diagrammatic Section through the Choir of Old and New St. Paul's.

From a drawing by MR. W. G. ALLEN.



One of the Southern Group of Buttresses.

any proposed treatment in connection with the zones of unequal settlement will be scrutinised with interest. The extension of the same series of fractures due to the parting company of heavily loaded and lightly loaded portions of the building also affects the upper portions of the drum and its surrounding external peristyle. These defects may be treated either with piecemeal repairs, such as replacing of fractured stones with sound new bonders, or by this process combined with some uniting framework which it may be thought advisable to introduce. Above the level of the white stone gallery the building is still large in scale, but the pressures more nearly conform to the limits covered by the ordinary experience of a building surveyor in active practice. The individual decay of materials under stress of weather and the attacks of anobiid beetles in the timbers of the outer dome have to be guarded against or made good. Even in the higher portions of the building the evidences of unequal settlement are to be seen, but they are slight in comparison with the serious defects below. The fragile nature of the stonework in the lantern exposed to violent winds at an exceptional height demands constant watching and periodical small repairs rather than any particularly drastic treatment.

The comparatively low outer walls of the building have in many places been pushed out by the thrust of its vaults, and are affected to some extent by subsidence and sliding on the foundations, these defects being easily apparent in the transepts and at the west portico and towers. Opinions will be divided as to whether these outward moving parts should be anchored to the inward sinking central group of eight piers by a light framework possessed of great tensile strength in an attempt to neutralise the opposite forces, or whether the high and heavy central part should be treated as an independent building—as its fractures have shown it to have accidentally become. This latter course would leave the low surrounding building to be dealt with by an entirely separate scheme of chainages by which movements of northern parts to the north may be harnessed to southern parts moving south, and so forth.

Several years ago tie-bars were made use of in the case of the south transept to tie in its outward leaning gable back into the body of the work. No ill results seem to have been precipitated by this use of ferrous metal, although in places the tie-bars are exposed to air in the loft of the transept roof. A consistent development of the same idea expressed in reinforced concrete might prove serviceable in avoiding or restraining in the future the outward movements in the side walls and towers.

One curious problem of repair is presented by the range of buttresses (see illustration) which project from the outer drum of the dome and spread some part of its weight and the wind pressures received by the upper part of the building upon the eight central piers and the four great arches and four semi-domes which span the spaces between them. All these buttresses have failed, more or less, and some of them are shattered from top to bottom by fractures practically parallel to the direction of their sloping outer edges. What view the conservators will take of these buttresses and their importance, whether they will be content to leave them fractured, to repair them with sound masonry, or to augment them by a scheme of reinforcement that might enable them more efficiently to function, remains to be seen.

In the meantime the Commission is going the right way to work and has very wisely spent a considerable amount of time in finding its way about the building, in surveying its deviations from the level and from the vertical and examining such details of its structure as can safely be made accessible for inspection. In such a complex building, where it is difficult even to know the exact position and orientation of certain details in the darkness of the lofts, some patience must be expended in these preliminaries.

To facilitate mental grasp of the subject a large isometric drawing is being prepared to show the co-ordination of the several parts of the building, especially in relation to its central mass. The first draft of this important drawing is here published, not so much for the artistic value of the sketch, but as an aid to the comprehension of what is in reality one of the most constructionally interesting buildings of all time.

A diagram published on page 110 shows the comparative sections of the choirs of Old and New St. Paul's, and throws into conspicuous emphasis the solid character of what may be called the lower parts of Wren's building.

Wren has left it on record that he made it a point to design for a long unbroken vista from end to end and from side to side of the church, and that he particularly wished to avoid the diminution of the main spans by the introduction of bulky piers at the crossing. These, as has been mentioned above, he kept so light as to give rise to a special problem in repair. To further the same artistic scheme, the piers of nave and choir were given greater sectional area than was absolutely necessary to support the comparatively light loads they are called upon to bear.

The much-debated screen wall above the exterior wall for the aisle of Wren's cathedral is prominently marked in the diagram. This upper portion of the wall has sometimes been compared to a Gothic pinnacle, and undoubtedly it acts as top-weight to modify the direction of the thrusts of aisle vault and flying buttress. It would have been placed to greater structural advantage on the inner rather than the outer face of the wall, but questions of stylistic propriety were allowed to take precedence over constructional fitness to this extent. The posing of an eccentric load upon the outer side of a wall which might be expected to rotate upon its base and move outwards under the pressure of two superimposed arches is not by any means ideal, and a detailed analysis of the pressures and resistances would seem to be necessary before it can be determined whether the top-weight, as applied at present, is useful or otherwise. The continuity of the wall from end to end of choir or nave probably helps considerably and brings in a factor not indicated in the section.

Attention has been concentrated upon the damaging effects of eccentric loads of late years by the use of steelwork under such conditions of financial stringency as to demand minute research into the strength of the material under differing conditions of loading.

It would be as absurd as it would be grossly unfair to expect from Sir Christopher Wren the best knowledge of our time on the subject, but the lack of it lies at the root of some of the principal defects in St. Paul's Cathedral.

The Study of the Past.

On January 8 Professor Theodore Fyfe lectured to the Liverpool Architectural Society on this subject. In the course of his remarks he said that they were trustees for posterity and should have constant regard to the fact that it was easy to destroy and impossible to replace. Architectural students, he said, would approach the study of the present with a certain amount of prejudice, but the greatest architecture of the past offered the desirable atmosphere of calm. Local museums of art should be encouraged liberally and English history in the schools ought to embrace the history of the arts and crafts. To this end, more local energy and enthusiasm were demanded. Students should receive training in the whole history of art on the broadest possible lines. Only when students were taught both to draw and to see would the modern methods of education get their chance to succeed fully. In conclusion, he suggested the constitution of an international committee to form central bureaux for comprehensive information about architecture, and to compile and publish an international catalogue.

The President (Mr. W. Glen Dobie) thanked the lecturer for a paper packed with thought and stimulating suggestions, and he was advised to further the establishment of a school of mediæval architecture. In reply, the lecturer said his students studied that form of architecture of their own free will.

THE LAW RELATING TO BUILDING.

By W. T. CRESWELL, Lic.R.I.B.A.; F.R.S.I. (*Barrister-at-Law*).

II.—AGENCY.

The Position of the Architect or Surveyor.

We have seen in the previous article that the position of the Architect or Surveyor, when superintending works for an employer or building owner under a building contract is that of agent. The majority of legal problems and complications, in business relations, between persons of every description, are settled by the law of agency. Disputes arise usually upon some question of simple contract, *e.g.*, (1) whether any contract exists; (2) whether there has been a breach of the provisions of such contract; (3) what remedy or legal rights the parties have. If an architect is employed to prepare a plan, or a surveyor to measure a piece of land or prepare a bill of quantities, and he performs the work as one holding himself out to have "reasonable care and skill" for such work, then he is entitled to be paid the stipulated (or a reasonable) remuneration for such work; and, when paid, his contract with the employer is at an end. The employer may decide not to use the plan, but is bound nevertheless to pay for it. Such simple transactions are rare.

Relationships with Third Parties.

In general a contract includes supervision of the work whilst in progress, granting of certificates for payment on account, and final settlement of accounts; and these bring the agent into certain relationship with third parties. It is this relationship which we have to consider, as it frequently gives rise to difficulties. Under a building contract, the architect or surveyor, in the interests of the work, is invested with certain special judicial or arbitration powers, anticipatory of possible disagreement. Let us review how an architect or surveyor may enter such employment or agency. Generally, when employed by a private individual no particular formality is customary. The custom is for the employer to interview the architect or surveyor, and make known to him his requirements. Though the latter would be well advised to obtain written instructions, or subsequent confirmation of what was agreed upon at the interview, before proceeding with any of the work, generally, he does nothing more than enter the facts in his diary. Without written evidence, it is difficult to prove any contract should the employer for any reason repudiate the verbal agreement.

Contracts in Writing.

Stress is laid on the fact, that to be binding, certain contracts must be in writing, and the knowledge of these as distinct from the above, is important to the architect or surveyor, to protect his own interests. A verbal agreement between the parties for work to be completed by all the parties to the agreement within a year, if it can be proved, is a binding contract. But anent a contract not to be completely performed by both sides within the year, the fourth section of the Statute of Frauds provides that "no action shall be brought . . . upon any agreement which is not to be performed within the space of one year from the making thereof unless the agreement upon which such action shall be brought or some memorandum or note thereof shall be in writing and signed by the party to be charged therewith or some other person thereunto by him lawfully authorised." Suppose, therefore, one party does all he has contracted to do inside the year, or, again, that by any possibility the other party could have fulfilled his undertakings within the year, then the statute does not apply and the contract need not be in writing. But if, on the other hand, the year is exceeded by a day, the contract must be in writing and duly signed, &c. In short, if the intention is that the contract shall be completed on both sides within the year, no writing is required; also, too, when the contract is to be entirely executed by one party within the year, no writing is required. (See Donellan *v.* Read (1832) 3 B. and Ad. 899.) In Hanan *v* Ehrlich (1912 A.C. 39) the House of Lords determined that where there is no mention of time, and the time is uncertain, the agreement is not within the statute; but, if a time longer than a year is mentioned, though there be a power to determine within the year, the agreement is within the statute and requires writing. In the event of litigation the contract, to be enforced, need only have been signed by the party to be charged. It must contain the names or a sufficient description of all parties, the subject matter of the agreement, and the consideration to be paid for the work to be done. It need not be one document, it may be more; but, if so, the papers placed together must include the essentials. Further, in any negotiations with corporations, it is necessary that the contract should specify the period of employment for each particular undertaking; and, in any case, all contracts with corporations (not being companies under the Companies Act, 1908), even those for work to be completed in less than a year, must be under seal of the corporation.

It behoves the architect or surveyor not to rely on a memorandum; indeed, any writing merely signed by an official of the corporation. Under Section 174 (1) of The Public Health Act, 1875, "every contract made by an urban authority whereof the value or amount exceeds fifty pounds shall be in writing and sealed with the common seal of such authority." Numerous actions have been lost where the plaintiff has relied on an unsealed contract made under the Public Health Act with an urban district council for work over fifty pounds; even though the authority has received the benefit of the work. Quite recently (October 15, 1923) such an action was lost by a quantity surveyor in the King's Bench Division. In Nixon *v.* Erith Urban District Council, plaintiff sued the Urban District Council for £1,150 for work done at the defendants' request in connection with a housing scheme. The contract was not sealed, and the court held that the plaintiff could not recover any fees.

It should be noted that the above quoted section applies only to contracts by urban authorities. Contracts with rural district councils are regulated by the ordinary law relating to corporate bodies, and, with few exceptions, must be made in writing under seal.

The Contract is "Personal."

The contract between an employer and an architect or surveyor is a "personal" contract, *i.e.*, the architect or surveyor undertakes to superintend the work himself. He cannot depute his duties, and it follows that in the event of his death the contract automatically terminates. In fact, his executors, &c., cannot even claim payment for work done up to the time of his death, excepting as the contract may have provided for payment of fees by instalments, when only those instalments already fully due may be claimed. In the event of the death of the employer, however, the employer' responsibilities devolve on his executors, &c., unless (and it is very rare) the contract provides against this. In the interests of everybody concerned the contract does usually provide that the executors, &c., shall complete the contract. In the event of the architect's or surveyor's services being retained at a salary, his executors would be able to render salary *pro rata* due to the day of his death. (See Stubbs *v.* The Holyhead Railway Co. 1867, L.R. 2 Ex. 311.)

Expert Evidence.

Architects and surveyors when employed to give expert evidence before Parliamentary Committees or the like, or in law courts, or at enquiries, arbitrations, &c., are allowed (as all other experts witnesses) peculiar privileges, *e.g.*, to refresh their memories by reference to their reports, accredited works, &c., on their special calling or topic, to quote cases or judgments in support of their evidence, also similar and accepted evidence given by them before in other cases, and to be paid fees commensurate with their standing and reputation.

HAMPTON COURT.*

Englishmen have a characteristic tendency to belittle the things of their own land, and it may come as a surprise to many of Mr. Law's readers to find Cardinal Wolsey placed among the great men of his time and in the first rank of the princes of the Renaissance. In a critical age names count for much, and Wolsey's position as a patron of the arts lacks just that dignity that is accorded to those who found employment for men who have since become famous as the master craftsmen of the period.

If only it could be discovered that Wolsey had persuaded Raphael or Michelangelo to work for him no more need be said; the critic who can afford to despise the work of an unknown native artist would immediately recognise the supreme value of that of the famous foreigner. As it is, some of the original decorations of Wolsey's palace at Hampton Court are the work of Italians attracted to England by his liberal patronage of the arts: the Arms of Cardinal Wolsey and certain roundels in terra-cotta including one with a head of Julius Cæsar, illustrated in the book, being the work of Joannes Majano. But whatever shortcomings may be attributed to Wolsey as an art patron, in accepting a lesser known craftsman in place of the great masters already overtasked with a multitude of commissions at Florence or Rome, the versatile spirit of the Cardinal statesman, whether measured by the magnificence of his buildings, his regal hospitalities and costly plate, or by his scholarly and statesmanlike qualities, can only be compared with the most famous rulers of his time.

In both Wolsey's sewerage works and pure water supply, with lead pipes passing under the Thames from Coombe Springs three and a half miles away, the attainments of sanitary science reach a level not usually credited to the Tudor period.

Mr. Law is prepared to see in the extraordinary pomp affected by Wolsey in all his affairs a regard for the good of the State which, the Cardinal evidently felt, could best be built up by an outward assumption of importance. This theory is borne out by a conversation between Wolsey and Dr. Barnes, "one of the new puritanic sect," in which Wolsey defends the extravagant show of his triumphant processions where crosses, pillars and pole-axes of silver were borne by attendants before him. The unpleasant reverse side to all this glory, instrumental as it may have been in lifting England to the place of a first-class power, was, if Shakespeare may be believed, nothing short of extortion ruthlessly applied.

Envy of the Cardinal's greatness found more than a colour of excuse in the contrast between the ideal character of a churchman and his actual behaviour as a statesman regulating all affairs by considerations of policy, and the profane subjects of some of his decorative tapestries were commented upon in a contemporary satire quoted in the book. Mr. Law's account is particularly opportune since it is published at a time when three rooms at Hampton Court Palace, formerly included in the residential portion of the building, have been thrown open to public inspection. These rooms have been identified as Wolsey's own private suite and retain a considerable amount of their original oak panelling and ceiling decoration, stone and brick fireplaces and mullioned windows. The illustrations include some very charming sketches in line, where the brick and mortar architecture is faithfully rendered, as well as some photographs of the newly-opened rooms.

* *Cardinal Wolsey at Hampton Court.* By Ernest Law, C.B. (London: George Bell & Sons. Price 2s. net).

EXHIBITION NOTES.

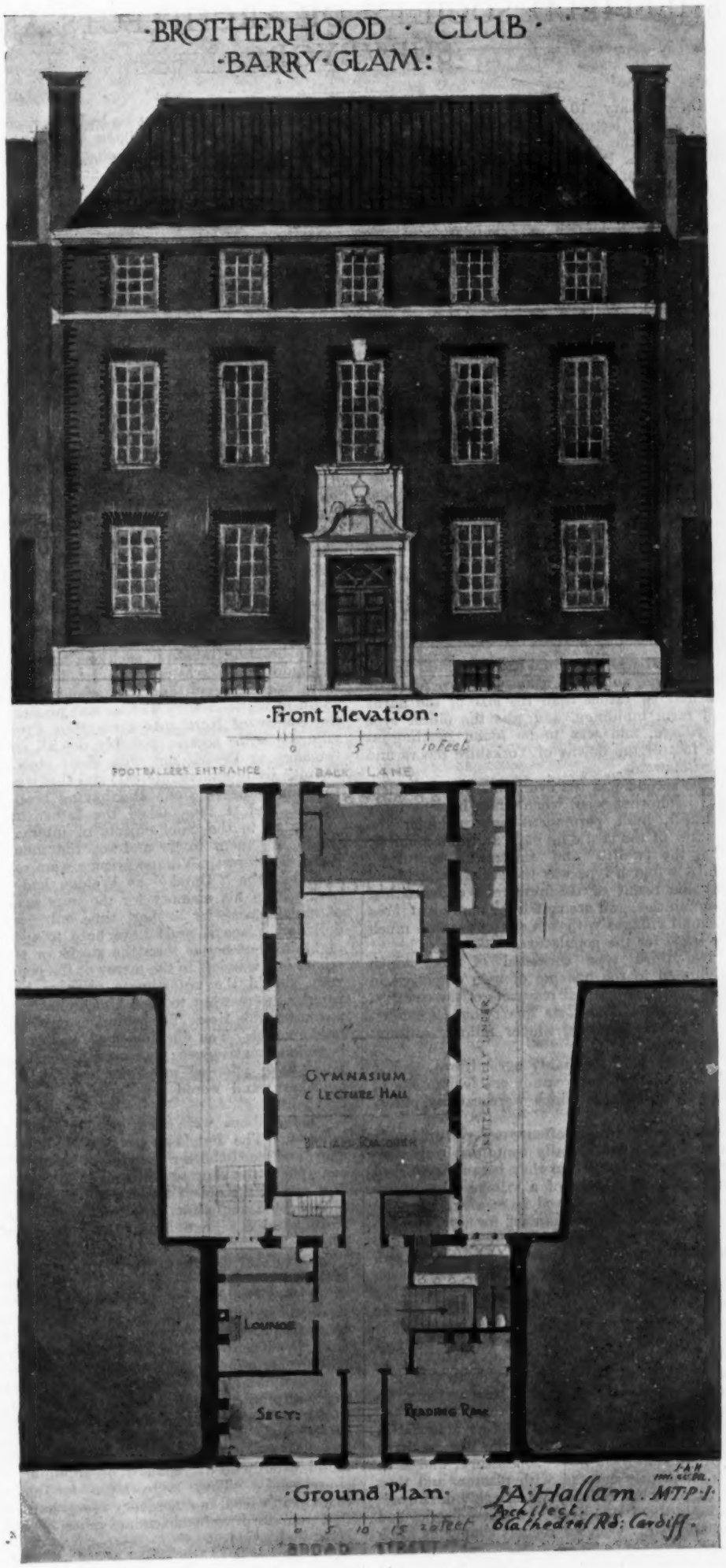
LEICESTER GALLERIES.

The water colours and paintings of Venice by Alfred Hayward, at the Leicester Galleries, will appeal to many for their delicacy of treatment; there is none of the *bravura* which many have essayed in treating of it, but the artist makes a distinctive choice of subjects and treats them with much refinement and good atmospheric effect: he certainly brings an artistic vision to play.

THE PASTEL SOCIETY.

Bearing in mind its possibilities, we always look forward to the exhibition of pastel drawings at the annual show of the Pastel Society with a certain degree of pleasurable anticipation. The present exhibition is well hung and has an attractive appearance in the pleasant galleries of the Institute. There are some undoubtedly able drawings to be seen, possibly more than usual, but there is still too much of mere pretty picture making, which might have been done, and perhaps better done, in other media.

Prominently displayed are three admirable drawings by Isaac Cohen. In the delightful portrait of Mrs. Edward McCormick (290) we see pastel at its best, for it shows the medium in its real value and colour, light, tone and drawing are skilfully combined. The "Blue Winch Ball" (289) is also admirable, and the "model posing" is a refined and charming sketch. The same artist has three other good exhibits. This central group is flanked by four pictures by Leonard Richmond, which indicate progressive attainment in the work of this brilliant pastellist. In a more subdued key than is usual to this gifted artist is the "Sand-dunes and Trees" (294), which is a restful and beautiful little landscape. More in his old manner is 287, which is full of a subtle cleverness. In the "Glow of Sunshine on the Sea" the artist has in some ways excelled himself, for he has obtained a breadth of softness which his skill often denies him. A very clever little drawing of St. Mark's, Venice (285), by Hedley Fitton, does not strike one as essentially pastellistic, whereas in the "Weigh-House "(284) J. B. Harrison uses the medium skilfully in a low tone of colour which is very pleasing. His "Old Harbour" has a telling charm of mystery. Mr.J.Littlejohns has a group of very clever drawings, amongst which Nos. 276 and 272 have a real touch of ideality. William Redworth, as usual, makes an interesting show of four drawings. Henry Butler's "Low Tide" (247), and his charming subject "Evening on the Hills," rank amongst the best. The former drawing has a freshness of treatment which is very effective. The "Old Mill on the Marsh," by T. W. Hammond (238), is an able drawing: it might well deceive one as to its medium. Miss M. G. W. Wilson comes to us in new guise with her "Casa Frollo, Venice" (231). This attractive picture of white colours and purple bloom does not recall her vigorous war pictures. Terrick Williams has a group of six clever drawings; the "Boats, St. Ives" is most like himself and very daintily expressed. "The Sandpit at Bramford" (190) is a fine broad vision by Leonard R. Squirrell. H. Davis Richter's "The Hillside" (205) is a superbrilliant expression of flowers. The portrait of E. J. Sullivan (123), by Mrs. F. Humphrey, is a masterly study. The snow scenes by Lawrence Ginnell (141 and 137) are noticeably good. Hanslip Fletcher has some interesting pencil sketches of Paris. Another very able portrait is the charcoal sketch of the Prime Minister (164) by R. G. Eves. There are shown three good pencil sketches of old architecture by Francis W. Bedford. The pen and pencil part of the exhibition is small, considering what excellent work in these mediums is being done to-day. We have not exhausted the list of what might well be praised, but on completing our round of the galleries we are inclined to think this is one of the best shows the Pastel Society has made.



Barry Brotherhood Club. MR. J. A. HALLAM, Architect. (*See p.* 106.)

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

On January 10 Captain L. M. Gotch, F.R.I.B.A., lectured to this Society on "The Charm of the English Village." Mr. J. R. Wigfull, the President, was in the chair. In the course of his remarks the lecturer said his greatest difficulty in preparing the lecture had been to choose his illustrations from out of the overwhelming wealth of examples, and they must forgive him if he had had recourse to his native county more frequently than to others, for two somewhat cogent reasons: First, because he knew it best, and second because it contained some of the finest examples of the features of the village about which he wished to talk for a little time.

Villages were rarely found in England on the hills or upland country, and when they did occur they were generally hidden away in narrow valleys down which ran a babbling brook. A certain village in Derbyshire was said to have the highest altitude of any in England, and a bleak, barren place it was. The reason lay in the origin of the village, which was primarily to give shelter to man and beast, and though the history of the village was not part of his subject a very brief outline of its origin would add to its interest.

In general terms the village of to-day (not the small industrial mining village) might be classified as follows:—(1) The farm village; (2) the feudal village; (3) the industrial village.

The first was a gradual growth round one or more farms, and could usually be recognised by the number rather than the size of the barns and farm buildings, and was the oldest type of village, and was to be found nestling at the foot of the downs of Yorkshire moors and the Cotswolds.

The second was the overflow of the retainers of a landowner who, when times became more peaceful, built permanent houses under the shadow of the castle or hall, and dated chiefly from the twelfth and thirteenth centuries; whilst a fourth type was the ecclesiastical, and was the result of the numerous ecclesiastical communities, and accounted for many instances of small villages with fine churches often much too large for the population.

The third type consisted of those which originated in the housing of men employed in developing the natural resources of the country, such as stone and slate quarrying (Weldon), mining, brickmaking, timber felling, milling, brewing, etc.

All four were inevitably agricultural, and in addition there were innumerable hamlets or clusters of cottages which were usually purely agricultural.

The latter were often very picturesquely situated, and occasionally contained some feature of real interest, but they invariably lacked the dominant feature of a village—the parish church. Whether viewed from afar, when its tower or spire was a landmark for several miles around, or first glimpsed round a bend in the road, or found tucked away amongst a protecting cluster of cottages and trees, the church was to a village what a mother was to her children. And from it, in truth, much of the village history might be culled, provided it was built of stone. And why only if built of stone? Because timber churches, being subject to fire, had almost all been destroyed, and the oldest one existing was Margaretting, in Essex, which was not more than 350 or 400 years old. Also brick as a building material in England was not in use from the Roman times until well into the fifteenth century, and then was frequently covered with plaster, and thus its value archæologically was largely destroyed. Those of them who lived in a stone district had perhaps rarely seen an ancient timber or brick church, and yet he assured them that they could walk, cycle, or motor from London to Hull and see no more than a dozen stone churches, if as many.

They would think that he had forgotten that he was lecturing on the village, and that he was giving them a dissertation on the church, but it was the centre of interest, and he could not leave it without a word as to the three functions for which it was used for most of them in the course of their brief spell of existence, namely, baptisms, marriages, and burials.

If they looked into the churchyard they would find much to interest them in the inscriptions on the headstones of the graves which filled "God's acre." If a slight shower drove them for shelter to the lych gate they might look back at the church and notice the water running off the tower and chancel roof, pouring out of the mouth of a bishop or devil or some local celebrity perpetuated in stone by the humour of the mason. After the rain had ceased they might look along the village street. They all knew such streets, superficially, as he did, but possibly had not studied their character. Like many human beings they improved on closer acquaintance. They had not the fine clothing or magnificence of their city fellows, but they had frequently more definite personality. The houses in them often had wonderful chimneys like the stack at Newport, such as were to be found throughout East Anglia, whilst the stone district of the Cotswolds and Northamptonshire had their own types.

The great forests of olden times provided cheap building material such as they had at Wigmore, in Worcestershire, tarred to make it more weather-proof, and close enough together to fill in between with wattles and plaster. In the county of Northants there were over 100 villages with scenes possibly not all so picturesque as Devon, but with more objects of definite architectural interest, and this was due to their being in stone and having been preserved, and if they asked the father of the village as to the chief objects of interest, he would tell them to go and see the following items of interest. Village prisons were rare to find, but the "Ound" at Weldon had been used within his memory for the imprisonment of malefactors—for a short time only—and a dull dark place it must have been to spend a night in; but better than the stocks or pillory where one was left to the mercy of the populace who, should the unfortunate prisoner be unpopular, were wont to give him or her a most uncomfortable time. The whipping post needed no comment. The ducking stool was quite an ingenious contrivance; and used in moderation must have afforded much amusement to the onlookers, and would not seriously harm the occupant.

Village shops were once quite a feature of interest. The butcher's shop with its half-door, and wood shutter for window was a typical example of the shop to be found in any village. But one of the oldest trades, and that immortalised by Longfellow, was that of the blacksmith, and a village forge was surely one of the most picturesque sights in all England.

Interesting, too, were the institutions found tucked away down side lanes in many of their villages—those delightful houses of rest for the aged and infirm. Sometimes, and let them hope most frequently, they were built and endowed from beneficent motives, but frequently from munificent, or for love of ostentation; they varied from humble, but homely, dwellings to a building with the founder's coat of arms shouting to all who passed the glory of his gift. Hospitals, not run by voluntary subscriptions, but by the church or its supporters, were found usually in its shadow or adjoining the churchyard. They were more for chronic cases than casual or emergency cases, but those that remained were charming relics of a bygone institution.

The demands of the Board of Education had caused the demolition of many old schools, but there remained a number in our villages such as those at Grassington in Yorkshire. He was purposely taking simple examples and could tell them of finer buildings architecturally, but they should learn to look for what might be found of interest in any village and not in just a few special localities; and they would find in many of the villages of England the old manor house with gables and mullioned windows, chimneys, and dormers.

Mills were essential in old days for every village to grind the local crops, transport being a difficulty; but now they were less and less used, and often the wheels or the sails were idle. A fascinating thing was the windmill with the graceful movement of its sails, and the well proportioned and picturesque mill was found still in Norfolk and Lincolnshire, but rarely in other parts of England. It always appeared to him as mysterious, and he could easily associate it with some foul deed, or picture the villain tying the heroine to one of the sails and then, having loosened the brake, leaving her to her fate.

In conclusion, it was tradition and time that gave charm to buildings and communities, but there was one outstanding feature to be found in every village which one could not leave without seeing. It had many forms and might be only a little tablet on the wall, or a crucifix by the church gate, a simple cross on the village green, or a St. George-surmounted column at the main cross roads. Whatever form the memorial might take the names were there—"the names of those who gave their lives in the Great War"—and, as the inscription told them, "their name liveth for evermore," and more than their name.

At the conclusion of the lecture a vote of thanks to the lecturer, moved by Major C. B. Flocton, and seconded by Mr. H. L. Paterson, was accorded.

Proposed New Thames Tunnel.

Sir Maurice Fitzmaurice, who was the engineer of the Rotherhithe Tunnel and the tramways subway under Kingsway, has been authorised by the Government to make an official full survey and to prepare plans and estimates for the construction of a road tunnel under the Thames between Gravesend and Tilbury. The tunnel would involve a large scheme of road construction and connect a great new east and west highway north of London (crossing all the main roads from the north) with the new highways in Kent, and bring the whole of Kent in direct communication with the north and west without the necessity of traffic passing through the Metropolitan area.

Additions at Bolesworth Castle.

A squash racquets court, &c., has just been completed at Bolesworth Castle, Tottenhall, near Chester. The addition includes a court and entertaining room, with visitors' gallery, heating chamber, &c., and is constructed of local stone in the courtyard of the Castle. The building possesses various unusual features, and perplexities of planning due to the differences of levels. Thus the court itself is below ground, the gallery being on the level of and with an entrance from the carriage drive, with exit at a lower level to the courtyard. The massive courtyard wall was carefully taken down to make room for the building, the face of the wall towards the drive being of tooled ashlar, and that towards the courtyard was scutched. These faces were divided and provided the two separate surfaces of the external walls of the new building, and were backed by brickwork, and so complete harmony with the Castle was obtained and the character of the whole preserved. It was essential that walls and floors should be dry, although below ground, and this was successfully met by cement concrete forming a raft over the surface, together with similar cement wall rendering with a generous fillet all round the whole performed in one operation, thus forming a tank capable either of holding or withstanding water. The work was designed by and carried out with direct labour under Mr. A. Kirby Parkinson, architect, of Chester.

TALL BUILDINGS, TALLER BUILDINGS, AND SKYSCRAPERS.—II.

BY HORACE R. APPELBEE.

IN the previous article (January 11) I showed the advantage of taller building for a given accommodation on a given area so far as light, air, sunshine and space for traffic or recreation were concerned. In this issue I propose to examine one or two details more closely, and to do this it is necessary to assume certain conditions which never exist in actual fact, such as a uniform height of story and uniform size and shape of rooms.

The height of the story will be convenient at 12 ft. 6 in. The rooms as 20 ft. deep on each side of a 6 ft. corridor will amount to 46 ft., and 4 ft. more will cover the two external walls and partitions between rooms and corridor, 50 ft. over all. The blocks to run north and south. The space between to be equal to the height of block (45 deg. light from floor level of lowest room). Every alternate space between blocks must be a street, and the intermediate ones may be streets or private property. The walls of the blocks are vertical and not stepped back. Sloping roofs are ignored. The site may be assumed unlimited from east to west, and crossed by roads in that direction; the part under consideration being a section between and exclusive of the east and west roads.

Under these conditions a block of buildings 300 ft. high will contain 24 stories, and similar blocks will be 300 ft. apart, or 350 centre to centre. If we halve the height we double the number of blocks, also they are closer; 150 ft. (12 stories) becomes 150 between and 200 centre to centre. Ten 300 ft. blocks at 350 centre to centre need 3,500 ft. run; twenty 150 ft. blocks at 200 centre to centre need 4,000 ft. run; sixty 50 ft. blocks at 100 centre to centre need 6,000 ft. run, and so on, showing greatly increased space needed for low buildings providing equal accommodation with tall buildings. Fuller details are given in the table below:—

Height of building (ft.)	300	150	100	75	50	25
Number of stories, at 12 ft. 6 in. each	24	12	8	6	4	2
Space between blocks	300	150	100	75	50	25
Distance c. to c. of blocks (50 ft. each)	350	200	150	125	100	75
Number of blocks to give equal floor area ..	10	20	30	40	60	120
Total space required for equal accommodation	3,500	4,000	4,500	5,000	6,000	9,000
Area of ground covered	500	1,000	1,500	2,000	3,000	6,000
Area of ground uncovered	3,000	3,000	3,000	3,000	3,000	3,000

The last line reveals a fact that will perhaps be new to many, viz., that if we fix the height of building in relation to width of street, we at the same time fix the amount of uncovered space in relation to the amount of covered space and it makes no difference whether the accommodation is on two or twenty floors. There is not any increase of congestion from this cause. The covered floor space being equal, the uncovered (street) area is also equal. It does not answer the question, Is a 50 ft. road sufficient for the local traffic with 50 ft. buildings? but it does say that if 50 ft. is sufficient, then 150 ft. between 150 ft. buildings of similar character is also sufficient.

The London Acts seem to have contemplated originally that the windows of habitable rooms should have open light to the extent of 45 deg., but there are so many exceptions that there is, I think, no case where that can be enforced except (strangely enough) in very wide streets. In a street 49 ft. wide we are limited to a building 49 ft. high plus two stories in the roof at 75 deg.; this reduces the light to the opposite ground floor to less than 45 deg. An increase of 2 ft. in the street width enables us to be 30 ft. higher with the building. At the back 45 deg. seems to have been contemplated, but was expressed as two vertical to one horizontal (67½ deg.) on the owner's property. As the back can be stepped up to the diagonal line many windows get far less than 45 deg.

The closed internal court of a building is worse still. An open space 100 ft. super. and only 8 ft. across may be 20 ft. high above window sills. On three sides we may have windows of habitable rooms or the fourth a collection of w.c.'s, urinals, and slop sinks, and at the bottom a skylight over and ventilating the ground floor. These varying arrangements would by themselves often produce habitable rooms with insufficient window space area and they are to some extent held in check by a further clause requiring a window into open air of 10 per cent. of the floor area. The effect is to break up further the lines of the "back additions."

The encouragement of higher buildings of simpler outlines (especially at the back) of equal accommodation resulting in wider streets and wider open spaces at the rear at ground or first floor levels is highly desirable. The way to it is to insist on the minimum angle of 45 deg. for light everywhere. For shops and business premises such as banks and insurance offices requiring a large area, the ground floor is exceptional always and some concession would have to be made in respect of it. I suggest that in streets of 100 ft. width and upward at pavement level the 45 deg. should be between the walls above ground floor and coupled with this a proviso that the shops did not project more than, say, 10 ft. from the upper wall or we should never get streets exceeding 100 ft. at the pavement level.

The strongest argument that can be brought against tall buildings is the fire risk. But if the buildings are properly planned is it any greater than with low buildings? Low buildings as such are not exempt. Many of us can remember the Cripplegate and Wood-street fires. London has had regulations to prevent the spread of fire for hundreds of years. The 1905 Amendment Act was the direct result of a relatively small celluloid fire, but though small there were many fatalities and injuries. Fifty years ago Chicago, or the greater part of it, was burnt out, but then it was a city of low and mostly wooden buildings and wooden "sidewalks," and fire spread easily. It is doubtful to-day if a cow kicking over an oil lamp among the straw would burn down the tall building quarter, and it may even be doubted if the cow and the oil lamp and the straw are to be found in that area. Conditions change.

When I was in Chicago many years ago I noticed many buildings had an iron cat ladder on the external wall from near street level to roof. One side of the ladder was a hose pipe, so that the fireman had no great length to carry up, and while one man was ascending to the outbreak others were attaching a hose to the foot of the fixture. At the top a hydrant (there was one on each floor) was opened and local floor hose connected. Simple, of course, but useless unless there is sufficient pressure of water, which in that place must be solely due to pumping. There are no hills in or near Chicago (the maximum is 40 ft.). There is plenty of water in Lake Michigan (an inland sea 50 miles wide at Chicago), but that is below street level. London has the advantage of being in a valley between two lines of hills 400 ft. high, which ought to assist the problem.

As an illustration of what increase of height can do, the following extracts from "The Housing Question in London, 1885 to 1900," an L.C.C. publication, will be interesting. "The streets" (of the condemned area) "were 20 in number, and the average population per room was about 2¼; 107 rooms having five or more inhabitants each.

"The streets and courts were very narrow, the widest being only 28 ft. across. . . . A large number of the houses had no back yards . . there were 730 houses . . . with population exclusive of those in lodging houses of 5,566, viz., 3,370 adults and 2,196 children. Including the lodging houses the total . . . on the area was 5,719 . . . a large proportion . . . belonging to the criminal classes. Living in one street only there were at one time no less than 64 persons who had served various terms of penal servitude" (pp. 190–191).

The new scheme:—

". . . has accommodation for 5,380 persons on the area, and in addition 18 shops and 77 workshops have been provided. . . . Every habitable room on the area is provided with a 45 deg. angle of light horizontally and vertically. The buildings are so arranged that nearly every room commands a pleasant outlook. The Entrance-avenue and the Circus are 60 ft. wide, and all principal streets 50 ft. There are three public gardens between the various blocks of dwellings of an aggregate area of nearly three-quarters of an acre" (pp. 208-209).

The present population of this area under L.C.C. is about 360 to 370 per acre. For comparison, the County of London (exclusive of the City) is about 56, and those living in the City about 28 per acre.

Mr. Voysey's interesting study (*The Builder*, December 28 last) for the Devonshire House site, shows clearly enough the advantage, so far as light and air are concerned, of tall buildings of simple lines from the ground up, in comparison with what we may expect with the sanction of the Building Acts. Perhaps I may suggest that he has provided too much accommodation for the site, and obviously he has not regarded the vertical 45 deg. as so essential as did the L.C.C. for the working-class dwellings I have referred to.

In conclusion, while advocating higher buildings, I have only done so in conjunction with wider open spaces and the abolition of closed lighting courts within a building for lighting and ventilating habitable rooms and offices. To increase the height and provide additional floor space, as in Regent-street, without widening the thoroughfare, appears to me to be a mistake, both from the æsthetic and traffic-congestion points of view. My "City of the Future," which I hope to describe some day, would be very different.

[This article is of considerable interest at the present time, but we do not necessarily agree with all the opinions expressed therein. —ED.]

Urban Housing.

Sir Charles T. Ruthen, O.B.E., Director-General of Housing, Ministry of Health, recently delivered a lecture on this subject at the College of Estate Management.

The lecturer commenced his remarks by a reference to some of the causes of the existing house shortage, and proceeded to show the attempts which had been taken during the last few years to grapple with the problem. He emphasised the fact that housing standards at the present day were considerably higher than the pre-war standards, and illustrated his point by detailed reference to some of the requirements of modern housing schemes. Another point which received careful consideration was the effect of employment conditions in the building trade on the output of houses, and the lecturer discussed at some length the vexed question of "dilution."

ARCHITECTS' AND BUILDERS' INQUIRY BUREAU.

Solid v. Hollow Floors.

SIR,—Many builders will welcome your Inquiry Bureau, which will doubtless add to the interest and usefulness of *The Builder*.

After an experience extending over 28 years I pronounce unhesitatingly in favour of the solid floor, and adopt it wherever practicable, in cottages and bungalows as well as in more expensive jobs. There are occasions when the solid floor cannot be laid with advantage, *e.g.*, where the soil level is more than, say, 1 ft. below the floor line, necessitating much filling in and ramming. Where there is a considerable space beneath the floor, one must perforce use joists and in these days of indifferent timber it is always advisable to thoroughly brush creosote the wood beneath the floor as a preventive of dry rot—not forgetting the sawn ends. The small extra cost is a good investment, especially in districts where dry rot is prevalent. The only advantage I find the hollow floor has, is that it can be laid more quickly, the coke breeze requiring a week or two to harden sufficiently to hold nails. Where time is an object, I have occasionally laid dovetailed slips in the coke breeze, but great care has to be taken to thoroughly soak the slips with creosote and well cover the whole surface with tar and mastic. If this is not done, dry rot may attack the slips and creep along under the floor. A great point in laying floors is to fix the boards pith side up, regardless as to which side is faced. This will in large measure counteract warping, which in a 7 in. board may be considerable, resulting in turned-up edges which crease floor coverings, especially lino. A word in reference to this. I have replaced scores of dry-rotted floors, and I think it is within the mark to say the inception of the rot has been caused by lino in nine cases out of ten. If this covering is to be used an uncovered margin of a few inches should be left around the room and the entire floor well stained with solignum before laying the lino.

The following advantages may be claimed for the solid floor :—

(1) A solid tread. There is a floor in my house which is part solid and part on joists. The difference in treading from one to the other is very noticeable, which I found by experiment is entirely a matter of sound, for, by closing the eyes and stopping the ears it is impossible to tell on which floor one is walking. The sense of a solid tread is, I think, generally appreciated. (2) Conduces to warmth. As there are no crevices there can be no draught. We hardly realise to what extent the discomfort of a room is due to draughts through the floor and around the skirtings. A hollow floor should always be laid with tongued and grooved boards for this reason. I have not met the objection raised by "Economist" that the surface is subject to cold and damp. In certain humid conditions of atmosphere all smooth cool surfaces inside a house will be found damp, but I cannot conceive a solid floor would be more liable than a hollow one. (3) Not so liable to dry rot. I have heard of dry rot in solid floors, but never met a case. I suspect lack of care in laying the floor. (4) Not liable to shrink away from the skirting. (5) The cost is about equal. In regard to cost—always a serious item to-day—if excavation for a hollow floor and filling for a solid, be taken as equal, the excess in cost of the solid floor is very small, say, about 5s. per square. Of course, the cost on different jobs is varied by price of aggregate and coke breeze. For purposes of comparison one has to take the following items :—(*a*) Solid floor: Level and ram earth; cement concrete and coke breeze; tar and mastic; square edge flooring and labour. (*b*) Hollow floor: Level and ram earth; lime concrete; sleeper walls and bond; joists, tongued and grooved flooring, and labour.

As a general rule and where practicable I adopt the solid floor.

ERNEST EDWARD SMITH.

Cromer.

Damp on Ceilings.

SIR,—On Thursday and Friday of last week I noticed a peculiar fact in my house, which has caused me some worry, especially as I have not as yet been able to find any solution for it myself, nor to learn of the cause from any one else. Perhaps you would be so good as to publish the following in the hope that a solution may be forthcoming from one of your many readers.

The trouble is this. On going to bed last Thursday I noticed that the ceiling of my room which faces east, was thoroughly discoloured with damp, but on going into the next room, which faces south, there was no discoloration. Astonished at this I made an inspection of all the rooms, when my surprise was greatly increased by finding that only one of the other rooms was discoloured, and that faced north. Now, Sir, as it had not rained at all during that day nor for several days, a strange thing to say in this country at this time of the year, and as there had been no escape of steam to account for such a discoloration, and if there had been steam surely it would have been on the walls as well as they are distempered and not papered, as there were neither of these, I am at a loss. Also, if there had been rain unnoticed during the night, though so far as I am aware my roof does not leak, certainly it has never shown any signs at any other time however wet the weather, why, Sir, should the ceilings of only two rooms show signs of damp, and these rooms which face in different directions? This last point will be appreciated the more thoroughly when it is realised that in this district there is a very considerable amount of wind, and it comes almost invariably from the south-west.

If you can answer my little riddle I shall be even the more indebted to you than at present, for if I may go so far as to refer to a personal matter, it would be to say that, living as I do so far out of things, the arrival of my weekly number of *The Builder* is an event looked forward to with very pleasant anticipation.

ERNEST MATTHEWS.

Polegate.

Acoustics.

SIR,—We have recently constructed a mess-room at the above works 32 ft. by 20 ft. by 14 ft. 6 in., having a ceiling with concave corners, and we find that the acoustics of the room are very unsatisfactory. It is very difficult to hear anyone speak, and meetings we have held have suffered very considerably in consequence. I would be glad if you could advise me of any means of obviating this trouble, or could recommend me to any firm who specialises in this line.

GEO. C. PEARSON.

Birmingham.

[We have no hesitation in referring our correspondent to Mr. Hope Bagenal, Architectural Association, Bedford-square, W.C. Mr. Bagenal has frequently contributed to these columns upon the subject of acoustics, and has been consulted by some of the leading architects of the day, who have been glad to take his very practical advice.—EDITOR.]

Plan and Specification.

SIR,—I should be obliged if you or one of your correspondents could advise me on the following query :—

"A" is erecting a small house, for which plans (one-eighth scale) and specification were prepared by an architect. "A" is supervising the erection himself; "B" is the contractor. The plan shows three-panel doors for the internal doors, but they are specified as four-panel doors. Is "B" correct in assuming that the specification is to be followed, and not the plan? Which is legally the more binding, the plan or the specification?

"PERPLEXED."

Neath.

Brickmaking Machinery.

SIR,—Would you kindly ask a manufacturer of lime-sand brick machinery to let me have a fairly close estimate of the cost of the necessary machinery for producing, say, 50,000 (fifty thousand) bricks per month f.o.b. Persian Gulf; also any other detailed information he can give me so as to form a reasonably reliable estimate of cost per 1,000 :—

	R.A.		£. s. d.
Sand	.. 13.2	.. 100 c. ft. ..	19 0
Lime	.. 95.8	.. „ ..	136 0
Labour	.. 150.	.. per month ..	7 4

and, further, whether the brick is suitable for use in a humid tropical climate.

In foundations the brick would come in contact with ground water having the following analysis :—Sodium Chloride, 6.172; Calcium Sulphate, 0.430; Magnesium Sulphate, 0.371; Magnesium Chloride, 0.127 grammes per 100 cc.

E. H. HARRISON.

Cement Concrete Partition Slabs.

What is the maximum length and height that cement concrete partition slabs (1½ in. to 9 in. thick and plastered both sides), can be used with safety without intermediate stiffeners, but all edges attached or bonded, and to what extent (if any) would doorways weaken them?

"QUERY."

Inquiries Received.

INDIA.—Stone preservative solution. Particulars of two specialities sent on by post.

LANCASHIRE.—Your inquiry regarding architects and garage authorities has been answered by post.

GOVERNMENT DEPARTMENT.—Particulars of glass substitute forwarded.

BUCKS.—Information regarding the legal query you raised has been sent on to you.

"BOT."—Your inquiry with regard to red roofing tiles made in Scotland is being attended to.

BIRMINGHAM.—Particulars of reinforced concrete safes have been sent on.

RENEY ("WOOD-WORK MACHINERY").—Your inquiry for wood-work machinery has been answered by post.

If student will send us his address, we will be pleased to send him the particulars he requires.

New Underground Headquarters.

The new Underground offices, at the back of Electric Railway House, Broadway, Westminster, will be ready for occupation in February. Twenty-two girders, weighing 550 tons, were thrown across the platforms of St. James's Park Station, and upon the strong framework thus formed the six-story building has been built. The reconstruction work has enabled the company practically to rebuild the station and to introduce bright tiling on the platforms. The lighting has thus been remarkably improved, and the old St. James's Park Station is hardly recognisable under the new scheme of platform architecture.

Bradford Mill Collapse.

The managing director of the firm concerned stated recently that the collapse of the floors was a complete mystery, and he could not suggest a reason pending a thorough examination, which would be made. The mill was seventy-two years old, and was regarded as one of the best built in Yorkshire. At no time had the firm received any intimation from their workpeople that there were indications of the top floor being weak or of it giving way. He asked that rumours as to the cause of the accident be not accepted, but that a proper investigation be awaited.

New Building, Gresham-street and Wood-street.

In our description of this building (illustrated in our last issue) it should have been mentioned that the heating installation will be carried out by Messrs. F. A. Norris & Dutton, of St. Andrew's Hill, E.C., and fire sprinklers by Vigilant Sprinklers, Ltd., of 1, Tudor-street, E.C.

PRACTICAL DESIGN FOR BUILDING CONSTRUCTION—II.

AN ELEMENTARY EXPLANATION OF THE APPLICATION OF THE THEORY OF CONSTRUCTION TO PRACTICAL DESIGN.

By EWART S. ANDREWS, B.Sc., M.I.Struct.E., A.M.Inst.C.E.

SECTION I.—WALLS AND FOUNDATIONS (Continued).

The Strength of Brickwork.

In spite of the fact that a considerable amount of careful experiment has been made in the subject, our knowledge of the strength of brickwork is still rather indefinite. Before considering the results of some of the most important of these investigations, we will see what is usually allowed in by-laws.

The London County Council in the Steel Frame Act (1909) allow the following pressures in tons per square foot :—

Blue brick in cement mortar.....	12
Hard brick (including London stock) in ditto	8
Ordinary brick in ditto	5

Lime mortar is not allowed in brickwork under the Steel Frame Act, but the figure usually taken for brickwork in lime mortar is 3 tons per square foot ; this would limit the height of a brick wall in lime mortar to 60 ft. if of constant thickness, apart from the question of floor loads of eccentric loading. As an interesting comparison we will give the results of some of the publications upon the subject.

R.I.B.A. Results.

We will take first the tests made by a committee of the R.I.B.A. ; their report (1905) should be studied carefully by all requiring a full account of their experiments and results. Tests were made on piers 6 ft. high and 18 in. square ; the cement mortar was 1 of Portland cement to 4 of washed river sand and their lime mortar was of grey lime in the proportion 1 to 2 and was probably stronger than that usually used in practice. Three series of tests were made and the first series gave low results. It is believed that it was discovered that the piers had not been bonded properly, and it is rumoured that, on being asked why this had occurred, the gentleman who had laid the bricks replied that he "thought they wanted them laid as we do in practice." The second and third series were bonded properly, and the following results were obtained for the crushing strengths in tons per square foot, the piers being five months old at the time of test.

	Lime Mortar.	Cement Mortar.
Stocks	18.6	39.3
Gault	31.1	51.3
Fletton ..	30.7	56.3
Leicester red ..	45.4	83.0
Stafford blue ..	114.3	135.4

We suggest that a factor of safety of 6 should be allowed for brick in cement mortar and of 8 for brick in lime mortar.

American Rules.

A comparatively recent American code (St. Louis, 1917) specifies the following allowable pressures on brickwork ; the figures are in tons per square foot :—

Vitrified paving brick in cement mortar 1 : 3	20
Hard pressed brick in cement mortar 1 : 3	16
Ordinary hard and red brick cement mortar 1 : 3	13
Ordinary hard and red cement and lime mortar 1 : 1 : 3	11
Merchantable brick, good lime mortar..	6.5

Vitrified paving brick and hard-pressed brick must not crush at less than 320 tons per sq. ft. ; ordinary hard and red brick must not crush at less than 150 tons per sq. ft., and merchantable brick must not crush at less than 110 tons per sq. ft.

Building Research Board's Tests on Thin Walls.

These important tests conducted by Dr. Oscar Faber were made upon thin walls with a view to obtaining information upon the bearing strength of thin walls employed in housing ; a full account of the results will be found in Special Report No. 3 of the Building Research Board on "The Stability of Thin Walls," published by H.M. Stationery Office. To facilitate comparison with the results and rules already given, the figures which are given in Dr. Faber's report in pounds per square inch have been converted here into tons per square foot. The test specimen in each case was a short length of wall 14 ins. long and 8 ft. 6 ins. wide. Tests were made after the walls were from 22 to 26 days old and gave the following crushing strengths in tons per sq. ft. :—

1st Series, 4½ in. walls :

Stock bricks 1 : 3 cement mortar ..	40.9
„ „ 1 : 6 „ „ ..	36.1
Fletton „ 1 : 3 „ „ ..	67.0
„ „ 1 : 6 „ „ ..	59.8
„ „ 1 : 3 lime „ ..	21.2
Concrete 1 : 2 : 4 cast in one piece ..	79.0
Concrete blocks 1 : 2 : 4 1 : 3 cement mortar	97.1

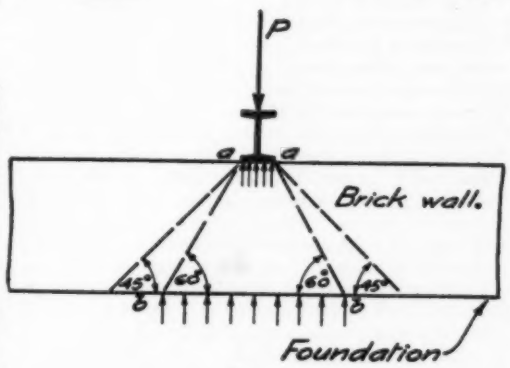


FIG. 2.

These tests were done in winter at an average temperature of 40 per cent.

2nd Series, varying thicknesses : 1 : 3 *cement mortar in each case* :

Fletton bricks on edge, 2⅝ in. thick ..	67.0
Coke breeze blocks, 3 in. thick ..	10.5
„ „ „ 4 in. thick ..	10.7
1 : 2 : 4 Concrete blocks, 4½ in. thick (semi-dry)	37.2
1 : 2 : 4 Concrete blocks 3 in. thick (wet process)	72.5

These tests were all made in May—a warm month.

These bring out certain very interesting and important facts ; in the first place a 2⅝ in. wall of Fletton bricks on edge in cement mortar is actually stronger than a 4½ in. wall of the Fletton bricks on face in lime mortar. We also note the superiority of the wall built of concrete blocks made on the wet process over those made by the semi-dry process, as well as the comparative inferiority of the breeze block wall.

American Tests on Effects of Mortar on Strength of Brick Piers.

In Bulletin No. 300, of Columbia University, U.S.A., is given the results of interesting tests made by Professor T. S. Macgregor upon the crushing strength of small brick piers, some of face brick and some of common brick, made with various mixtures of cement and lime mortar varying from a 1 : 3 cement-sand mortar to a 1 : 3 lime sand mortar. Both the face brick and the common brick piers show higher strengths with mortars containing some lime than with mortars containing cement only, the highest strength (about 30 per cent. increase) being shown by cement mortars containing 15 to 25 per cent. of lime. Professor Macgregor explains the result of the more perfect bedding secured with the lime-mixed mortar on account of its higher plasticity, and by the decrease of the "suction" effect of the brick on the mortar.

General Conclusion from Test Results.

The general conclusion at which we have arrived as the result of the experiments which have been done up to the present on the strength of brickwork is that by careful choice of the mortar to suit the crushing strength of the brick itself and by care in preventing scamping of the work, brickwork of very high strength can be obtained. The stronger the brick, the stronger should be the strength of the mortar to develop the best strength of the brickwork ; for blue bricks, for instance, a cement mortar of 1 : 2 mix can economically be employed, and the safe working pressure can then be taken at 25 tons per sq. ft. With poor bricks it is not wise to use a very hard mortar because the lack of yield on the bed is liable to lead to cracking of the bricks. There are among us some who would have us believe that the past generation of architects and builders carried out better work and were more honest as craftsmen than those of to-day. Should any of our readers share this hallucination, we recommend them to consult some of the District Surveyors of London.

Our attention was drawn a short while ago to some brick piers in London which were cracked and bulging and looking generally ill. Calculations of the loads on them showed that neglecting eccentricity of loads which would nearly double the stress, the mean pressure on one of them was 17.8 tons per sq. ft.

The wall was built of stock bricks in cement mortar, and some time after the building had been erected an optimistic plumber had generously hacked into this very bad pier to put in some hot water pipes, and had never made good. It is time that we inaugurated a Society for the Protection of Cruelty to Buildings.

"Dispersion" of Concentrated Loads.

When concentrated loads occur on brickwork, such as those due to girders resting upon brick walls, it is safe to allow a higher pressure immediately below the load than in the case of a pier in which the whole of the top surface is loaded.

Tests made many years ago by Bauschinger show that if the load may spread in two directions, as indicated in Fig. 2, we may allow the stresses to be increased by 50 per cent., and if the load comes near one edge but can spread in the other direction, we recommend that an increase of 25 per cent. be allowed.

This question of the dispersion of loads also effects the calculations of the pressures on a foundation or layer below the brickwork. If we have a pressure P applied on a length *a a* of brickwork, and we draw lines *a b* at 60 deg. to the horizontal, we find a length *b b* on the foundation upon which we may regard the pressure P as uniformly distributed for purposes of calculation of the foundations ; if a similar spread or dispersion can take place in a plane at right angles we proceed in a similar manner for that plane. The angle of 60 deg. is called the *angle of dispersion* ; some designers adopt an angle of 45 deg., as also shown, for this purpose, while others allow 45 deg. for stone and concrete and 60 deg. for brickwork. We believe there is evidence to support the view that the load will disperse at about an angle of 45 deg., but if we adopt that view we should allow for the fact that the pressure will be greater at the centre than at the outsides. By taking 60 deg. instead of 45 deg. and regarding the pressure as uniform over *b b* we are really making allowance for the variation in pressure.

Carlton House Terrace.

Three of the mansions at Carlton House-terrace are in the process of being converted into flats. They are Nos. 8, 19, and 20 respectively.

THE SOCIETY OF ARCHITECTS.

THE thirty-ninth annual report of the Society of Architects has just been issued. In addition to those matters already announced in our pages, the following extracts are of interest:—

The Committee report that a total of 161 applications were received for admission to the various classes of membership, of which 123 were admitted, including 13 transfers to a higher class, and 5 members were reinstated. The Society lost 20 members by death, and 39 by resignation and lapses, and 5 were transferred to the retired list, the total strength of the Society on October 31, 1923, being: Fellows, 202; Members, 1,136; Honorary Members, 23; Retired Members, 41; Licentiates, 167; Students, 132; a total of 1701, being a nett total increase of 71 over last year.

The Society's arbitration rules have been redrafted and the scope of the Committee enlarged, so that it can deal not only with references as provided for in the Society's form of contract, but can also be available for reference by consent out of Court and under the order of the Court concerning matters in dispute affecting or connected with architecture, or the building or allied trades. Major Watson, F.R.I.B.A., Barrister-at-law, has been appointed Registrar of the Committee.

Competitions and Scholarships.—Last year the four quarterly Competitions and the travelling studentship and the architectural scholarship competitions were superseded by half-yearly design competitions each of the value of £40. It was found, however, that the latter did not receive the support which was anticipated owing to the greater attractions of other educational facilities such as the correspondence design course. It was, therefore, decided to discard the half-yearly design competition and to concentrate on the correspondence design course and the open competitions, viz., the Victory scholarship and the Trehearne-Norman essay competition, and the foreign travel scholarship.

Education Conference, 1924.—The Society is represented in an advisory capacity on the R.I.B.A. Board of architectural education, and has expressed its desire to co-operate and take part in the conference which is to be held under the auspices of the R.I.B.A. in the autumn of 1924.

The General Purposes Committee had referred to it the duty of submitting to the Council the names of candidates to fill the office of a Vice-President vacant by the regretted death of the late Mr. George Paine, and also vacancies on the Council due to the withdrawal of Messrs. Henry Tanner, T. Stewart Inglis, and F. Hall-Jones, who were unable to continue their services owing to the pressure of their other engagements. The Council subsequently co-opted Mr. Sullivan as a Vice-President, and Messrs. T. G. Davidson, W. G. Ingram, and P. M. Davson as ordinary members of the Council. To the vacancy caused by the transfer of Mr. Sullivan to the office of a Vice-President, the Council co-opted Mr. C. F. Norman.

With regard to the question of Unification and Registration, the dissolution of the Unification and Registration Committee of 1922 was followed by an announcement in the R.I.B.A. Journal of January 13, 1923, of a draft Bill for the registration of architects prepared by the Registration Committee of the R.I.B.A. and approved by that Council. The first official communication which the Society received from the Institute on the subject was a letter, dated January 23, enclosing a copy of the Bill which it was stated was to be introduced into the House of Lords the following month. This draft Bill differed in points of detail from the print in the R.I.B.A. Journal. It was considered by the Council of the Society on January 25, and an intimation was sent to the R.I.B.A. that the Society was unable to support the proposal in the form in which it was then presented. The draft Bill was presented to the general body of members of the R.I.B.A. on January 29, when the meeting decided not to consider it until the other professional societies and interests affected had been consulted and a general consensus of opinion obtained in favour of the Bill.

General.—The Annual Report being mainly a record of work in hand and accomplished, necessarily gives little indication to the members as to how the results were obtained. The greater part of the detail work of the Society is done in Committee and the members of the Society will realise that their representatives on the Council are called upon to devote a great deal of time to its affairs. It follows, therefore, that service on the governing body of the Society is an honour which carries with it a great deal of responsibility and entails much personal attention to the work.

BOOK REVIEWS.

Quantity Surveying for Builders. By WILFRID L. EVERSHED, F.S.I. The "D.U." Technical Series. (London: Chapman & Hall, Ltd. Price 10s. 6d. net.) 1923.

The author has succeeded in producing an essentially practical work, and one which will be found of great assistance to the student of quantity taking. It consists largely of examination papers of the City and Guilds of London Institute, and of the Surveyors' Institution, with examples of the answers to many of them. The author quite wisely credits quantity surveyors with a certain degree of individuality, a characteristic that many feared would be eliminated by the production of a "Standard" method. This, however, is happily not the case, so that while in some instances one would not be in complete agreement with some of the methods advocated in the book under review, the student on the whole may be safely recommended to study the work closely in the early stages of his training, leaving the personal element to the time when he can run alone. There is a long series of tables of volumes and areas with algebraic formulæ, but we think in practice the surveyor would use the more rough and ready methods now in use, which are to all intents and purposes practically correct.

The system of "timesing" and "dotting on" described on pp. 34 and 35 are somewhat confusing, and we think there is a clerical error in examples Nos. 31 and 32.

To be somewhat hypercritical, perhaps one might wish the method of arriving at the number of rolls in example No. 55 and the size of soakers in example No. 62 were more explicit, while we cannot understand how the width of boarding and lead to valley in the latter example is arrived at. Taking the work as a whole, it will be found most useful to the student for examination purposes, as well as for practical use in the exercise of his profession, and one which merits a place in the front rank of modern technical works.

Some Factors relating to the Re-housing of Slum Dwellers. By JOHN J. CLARKE, M.A. The University Press of Liverpool, Ltd. (London: Hodder & Stoughton, Ltd.) Price 2s. net.

It was opportune that this paper should have been read to the British Association when that body was meeting in a city that has been a pioneer in slum clearance, and that has also been in the forefront with large post-war housing schemes. The paper here reproduced deals with re-housing in three main divisions: before the war, after the war, and in the future—and the full horror of the slums is revealed. Tables of mortality are given covering a three years' average in an insanitary area, the same average in the area after reconstruction, and the same over the whole city. The following figures are those of infant mortality: 259, 162, 119 per thousand, the phthisis rate being 4.0, 1.9, 1.7. Such figures speak for themselves, and we must note that the figures for the reconstructed area are not as good as they should be because the inhabitants are dispossessed slum tenants on whom slum life has left its mark. We are reminded that there are 72,000 back-to-back houses in Leeds where adequate ventilation is impossible, and that similar conditions throughout the country are responsible for the existence of 1,166,784 children defective in some respect out of a total of 2,434,252 examined. In 1920 the insured population of England and Wales lost fourteen million weeks of work through sickness, most of it preventable. The following example is cited in illustration of the kind of conditions that thousands of our fellow-citizens have to tolerate; it is a description of a house that is rather typical than unique:—

The ground floor is occupied as workshops.

First Floor.—Two rooms: occupied by four adults. One room: husband, wife, and five children, aged ten and under. One room: lodger. One room: single woman.

Attic.—Husband, wife, and one child.

The roof leaks badly, and as the man, an ex-soldier, stood on the chair to repair it, the four legs slipped through the rotten floor. The rent was 3s. 6d. per week, but in consequence of his improvements it has been increased to 4s. 6d. per week. The total rentals derived from this house are about £170 per annum.

As a further example of the outrageous state of affairs at present existing we are given the following particulars of houses with rooms to let "furnished":—

Rent of house.		Tenant receives	
6s. 2d.	per week ...	32s. 6d.	for rooms.
5s. 6d.	,, ...	36s. 4d.	,,
5s. 6d.	,, ...	32s. 8d.	,,
5s. 5d.	,, ...	34s. 0d.	,,
5s. 5d.	,, ...	42s. 0d.	,,

The author rightly insists that it is a fallacy to suppose that the normal slum dweller will not respond to better conditions, and we are assured that where the chance has been given "undoubtedly the improved environment has had a beneficial effect upon the character and health of the people." It is further asserted that the country could spend without loss £50,000,000 annually, or, capitalised at 5 per cent., £1,000,000,000, on clearing the slum areas and securing better housing and living accommodation, provided that the cost of sickness and disablement were thereby reduced by one-third; for every penny spent on housing we save the rates threepence on other public services.

The paper contains some considerations of the transport problem, especially in connection with the Liverpool docks, and a proposal for a great national scheme for re-housing slum dwellers is formulated. It is to be hoped that this paper will be read and taken to heart, since nothing but the force of public opinion is likely to make politicians and public bodies take the slum problem with the seriousness that it imperatively demands.

BOOKS RECEIVED.

EXAMPLES OF MODERN ARCHITECTURE (in Parts). By C. F. W. Dening, R. H. Goodsall, J. Stockdale Harrison, and Shirley Harrison, L. W. Barnard. (London: Ed. J. Burrow & Co., Ltd.) Price 2s. each.

PROCTOR'S USEFUL TABLES, 1923. (London: Edward Le Bas & Co.) Price 1s.

FURNITURE MOULDINGS. By E. J. Warne. (London: Ernest Benn, Ltd.) Price 25s. net.

THE CHEMISTRY OF PAINTS, PIGMENTS AND VARNISHES. By J. Gauld Bearn. (London: Ernest Benn, Ltd.) Price 30s. net.

I FOR ONE. By J. B. Priestley. (London: John Lane, The Bodley Head, Ltd.) Price 6s. net.

QUANTITIES. By Sir Banister Fletcher and H. Phillips Fletcher. (London: B. T. Batsford, Ltd.). Price 10s. net.

AN INVENTORY OF THE HISTORICAL MONUMENTS IN ESSEX. (London: H.M. Stationery Office.) Price 25s. net.

DOMESTIC ARCHITECTURE OF THE AMERICAN COLONIES AND OF THE EARLY REPUBLIC. By Fiske Kimball. (London: B. T. Batsford, Ltd.). Price £3 3s.

THE BUILDING TRADE.

MODERN BUILDERS' MACHINERY.

By STAFFORD RANSOME.

II.—THE SELECTION OF MACHINERY.

THE selection of a builder's plant, even if it is only a small one and the expenditure involved is not large, is a matter of the greatest importance if efficiency, profit and freedom from difficulties are to be secured. If a builder purchases bad materials for construction, bricks, cement, timber, or hardware, it may land him into difficulties in connection with the contracts for which he uses them, but there the matter, serious as it may be, ends. With bad machinery, however, there is no end to his difficulties and losses so long as that machinery is kept running. He goes on steadily wasting materials and turning out bad work until the day comes when he scraps his plant, and the sooner that day arrives the better for him.

It may be taken for granted that the large builder who has been using an extensive plant of wood-working machinery, and possibly a number of plants in different parts of the country, has a good idea of what he requires when he wishes to extend his installations. At all events, he usually has in his employ in connection with his wood conversion department highly competent sawmill experts, who should be fully alive to all new moves on the part of the manufacturers of machines and are consequently able to advise him in making his selection. With the medium and small man, however, such is by no means always the case. He must therefore rely on his own judgment and common sense, which may or may not be backed by any great technical knowledge in selecting his machinery.

The Sources of Supply.

Let us first consider the market from which he can pick and choose. In Britain, at all events, he is far better off in this respect than is the purchaser in any other country. Not only has he about a dozen British manufacturers, any one of whom will be able to fit him out with anything that he may require, but he will find as many more who make certain of the machines which would answer his purpose, though they could not complete his outfit. Quite apart from these, however, he has all the American, French, German, Austrian, Swiss, Scandinavian and Belgian makers sitting on his doorstep, for there is not a single important foreign maker of wood-working machinery in the whole world, of any sort of reputation, good or bad, who is not actively represented in England.

Foreign Machinery.

Many of these foreign firms carry stocks in this country. It is not my purpose here to discuss the virtues and vices of Free Trade and Protection, but in considering the question of the selection of machinery we cannot ignore the fact that under the former the builder in Great Britain has a far wider selection of makers to choose from than can occur in any other country under the sun. The only thing that he has to worry himself about is the question as to what *is* the best for his purpose. That question, however, is in itself a big one, and is greatly accentuated by the immense variety of machines which are at his disposal to choose from. It is further complicated by the diversity of the prices asked for by the different makers for apparently the same thing and by the sometimes exaggerated statements made by over-zealous salesmen as to the capacities and qualities of their respective machines.

In advising on the selection of wood-working machines, generalisation as a rule is apt to be both unsatisfactory and misleading. There is, however, one matter about which we may lay down a definite rule which covers all cases. That is, that it is always a fatal mistake to purchase a cheap machine because it is cheap. Get the best machine that is available for your purpose, not necessarily the most elaborate one, because you may not want extraordinarily high speeds of output, but get the best for your requirements and strike the best bargain in purchasing it that you can with the maker.

At the present day, speaking for the moment of British machines only, there is no scope for any considerable difference of price in the same type of machine from different makers unless the quality of those machines varies accordingly. Either the one is good and the other bad, or the one possesses certain features in materials, design or construction that are not possessed by the other. These differences and their value may not always be easily apparent to the unsophisticated purchaser, but they will be there and will be appreciable to the expert.

Tools of Precision.

We must bear in mind that practically all wood-working machines are, or should be, tools of precision. They all have to produce extremely fine and accurate work, and most of it is done by spindles revolving at very high speeds. The difference between good and bad planing, for instance, may sometimes be represented by one-thousandth of an inch, and the unnecessary waste of $\frac{1}{32}$ in. in the thickness of a saw-cut may make the difference between profit and loss. Machines for effecting this exactitude at high speeds do not lend themselves to being manufactured on the mass production principle, and they are never so made. All the makers manufacture virtually under approximately the same conditions as to labour and materials and facilities, and it is only by applying the principle of mass production to these machines that they could drastically reduce their cost. We may therefore take it as an axiom that variation in prices quoted, except within a very narrow margin, means a difference in the quality of the machines. Many builders start using machinery at an early stage in their career, when their financial resources are strictly limited, and in their anxiety to equip themselves they are more frequently apt to fall victims to the cheap maker. Such a policy often spells disaster, and has sometimes turned what would have been a profitable contract into a loss, at a time when a beginner was struggling to make headway.

It must be accepted as a fact that the difference in cost between good and bad machines will, as a rule, be paid for over and over again by the good machinery, if kept at work, in the course of a few months and often in only a few weeks. If, therefore, a purchaser considers that he has just enough money to pay the price of a cheap plant, but not of a higher-priced one, he will be wise to keep his money in his pocket until he can afford to raise the extra money. If such a man cannot get the manufacturers of the better machines to give him a certain amount of credit for a portion of the plant, it should not be difficult for the purchaser to arrange for someone outside to finance his purchase for him, provided that he can show he has *bona-fide* contracts which justify the purchase of machinery. This is merely a legitimate business proposition.

Some years ago I was consulted by a builder whose machinery was giving a lot of trouble. He was a beginner, and had only four simple machines, a saw bench, a mortising and boring machine, an irregular spindle and an over-and-under planer. He could not get good work, he had had constant troubles with his bearings and some breakages.

"Why did you buy this rubbish?" I asked him.

"Well," he said, "this contract is very rushed. I hadn't time even to put up a proper building for the machines, and I have to use them rather roughly, so I didn't think that it was worth while getting a more expensive plant, especially as I don't know whether I shall want the machines when this contract is done."

I explained to him that if he had purchased a good plant in the first instance it would have been saleable at the end of his contract for far more than the difference between the prices of the good and bad plant. It is true that the machines were being badly used, badly housed, and apparently handled without that care which is essential to the best results. But they were bad throughout, light, flimsy and roughly fitted. Properly constructed wood-working machines will always stand harsher treatment than bad ones, and they are much more easily adjusted and worked than are those of inferior quality.

In going into figures it was found that his machines, exclusive of the motive power, which was good enough, had cost him about £300, and breakages, repairs, stoppages and unnecessary labour had cost him in a few months another £250, and he had wasted a large quantity of material. He could have purchased a properly-made plant for rather less than £400. Thus, even when a builder has to subject his machines to rather rough treatment and to force their output, as is sometimes the case, especially when machines are accommodated temporarily in connection with a hurried contract, the best machines are by far the cheapest.

Metric Standards.

Quite apart from the question of sentiment or patriotism or quality, there is a difficulty in using Continental machines in this country, and that is that as all their parts are made to metric measurements, they do not conform to our standards. Thus, we may have a saw of 39.4 in. dia. capable of cutting a board 14.9 in. deep. The widths and diameters of the pulleys are also of odd dimensions, as are also the diameters of the spindles and bearings. Moreover, the threads of the screws which, in case of repairs, cannot be cut with British standard taps and dies, and the heads of the screws and bolts which cannot be negotiated by our keys and spanners. Driving pulleys, too, have to be revised, and repairs in the case of accidents or wear are difficult, costly and sometimes impossible.

American Machines.

The American machines that are offered to the builder in this country, and their name is legion, do not suffer from the same disadvantage of differing from our standard dimensions, and many of them are highly ingenious. More particularly is this so in the case of special tools for a particular class of work, such as sand-papering machines of elaborate design, ply-wood machinery, twin band saws for re-sawing, &c. None of these, however, is of interest to the ordinary builder in this country, and but few are required even by the large builder. Of the more general purpose American machines, there is little to differentiate them from those of British make, and certainly their quality is no better than that of the average British machines. As a rule, too, when compared with the best British machines, they are of a less durable construction.

The makers of different nationalities are quick to adopt any improvement that occurs in the designs of their foreign competitors, and British firms are very much alive to anything which goes on elsewhere in this respect. Their own models have been copied all over the world in times gone by, and, if the absence of an import tariff is of any good from the point of view of the manufacturer in the country where there is no duty on foreign machinery, it is that it affords him a very excellent opportunity to see every machine in the world with which he has to compete and to take measures to adopt anything new and to

improve upon those novelties in designing his own machines. It is for this reason that the best British wood-working machinery is always up to date. The British manufacturer cannot help knowing what he is up against by the object lessons afforded by the foreign machinery which is dumped at his door.

German Machinery.

Before the war if a builder in this country used other than British wood-working machinery it was usually of German construction. There were two reasons for this. First, it was extremely cheap, and, second, the purchaser could demand and obtain practically any terms of payment that suited him. There was never any question of the quality of such machines. They were in nearly every case belated copies of the American designs, and bad at that. In fact, many of these German machines were in design ten or fifteen years behind the rest of the world. Nevertheless, they sold because there is, and always will be, a class of customer to whom low first cost and credit facilities must appeal irresistibly.

To sum the matter up I would say again, that if the builder is to get the best or even good results he must purchase the best machinery that is procurable. In most cases for his purposes unquestionably British machines are the best. But he must remember that there are good and bad British machines. Let the purchaser look around and examine everything that is offered to him, and unless he is a man of technical experience let him get expert advice, for, as a builder once said to me, "one machine looks very much like another." That is actually the real danger which the unsophisticated or careless purchaser has to face.

THE NATIONAL ASSOCIATION OF MASTER PLASTERERS.

THE National Association of Master Plasterers held their annual dinner at the Holborn Restaurant on January 14. Mr. J. E. Chadwick, the President, was in the chair.

After the loyal toasts had been honoured, Mr. E. J. Brown, in proposing "The National Association of Master Plasterers," said he thought the building trade and the Association had a troublesome period ahead of them for many years to come. Owing to the shortage of skilled labour they were bound to find the situation very difficult. He appealed for unity among the builders, plasterers, plumbers, and allied trades.

Mr. H. H. Hodkin, in responding, said the plasterers were the friends of the builder, and tried to smooth the way in many directions. They kept the balance, and acted, as it were, as ballast. They wished to run on parallel lines and not diverge in an opposite direction. It was necessary that they should get to know one another. The bulk of them, after all, were connected with the London Master Builders' Association. At the same time, although they had much in common, the National Association ought not to lose its own identity.

Mr. Roland B. Chessum, in proposing "The President and Officers," said he wished the President every success in the position he now occupied. To a certain extent it depended on the assistance he received from his officers. The present situation made it a more strenuous office than it had ever been before. Years ago it was child's play compared with its onerous character at the present time. Although only representing one craft, there was a multitude of duties to be attended to by the President and his officers. They would be in a happy position if they could roll out the rough places in life to make it a bit easier for those that came after them. If they worked for the benefit of the industry, and the community in general, it would be much better than a merely selfish attitude towards their own particular problems.

The President, in responding, said the various trades were dependent on each other. In regard to their various troubles it was a poor soldier that turned his back upon difficulties. The Association would carry on for the best of everyone, and give credit to others for the desire to see eye to eye with them.

Mr. Samuel Wright, in proposing "The Visitors," said there was close co-operation between the sub-contractors and the London Master Builders' Association. There was no man like an expert to carry out the work of any particular branch—particularly so in the case of plasterers. They either inherited their craft, or spent years of their life in training. Their branch of the building trade was one of the oldest and one of the most important. The first pre-historic joiner had to call in the plasterer to join up the cracks. The master craftsman would remain for many years yet to come.

Mr. Somers, in briefly responding, mentioned that he had been connected with the Master Builders for a period of seven or eight years.

ELECTRICAL CONTRACTORS' ASSOCIATION.

ON January 15, at the Hotel Cecil, Mr. Robert Robson (President) occupied the chair at the annual dinner of the Electrical Contractors' Association, when some 170 guests and members were present.

After the loyal toasts had been honoured, Sir James L. Devonshire, K.B.E., proposed "The Allied Associations and Honorary Officials." It was the first time, he said, he realised that, since 1915, the Association really consisted of three Associations. In 1909 the Association secured an important clause for the protection of its members; and again in 1919 secured there should be no unfair municipal competition. It could not be too often emphasised that the success of any industry depended on the success of its retail traders.

In responding on behalf of the Allied Associations, Mr. R. Robson said he would like to see the Association spirit installed in every one of their members. If they could get enthusiasm members could carry through any project they had in hand. Their members were the last link between the public and the manufacturers; and it was up to them to educate the public in the use of electricity. He maintained that it was their duty to sell to the public electrical apparatus; and they should sell it in their own premises. He contended that the electrical industry was only in the infancy of its possible development; they had a tremendous field in front of them, and if they only realised it there was work for all of them.

In regard to the Wembley Exhibition, it was for the good of their industry, and they had just passed a resolution to induce other sections of the industry to use British material. By other sections he meant the merchants who supplied them with material. In regard to the Supply Authorities the first thing was to get on good terms with them, and when they were on a friendly footing it would be easier to open up negotiations than as strangers. It was also important to get their members on the City councils.

He was very glad to know that voluntary registration of electrical contractors was almost in being. In a few weeks he hoped contractors would be asked to register.

Mr. W. R. Rawlings proposed "The Guests," and, in responding, Sir John Snell said the duties of the Commissioners were of a fairly arduous character. As a result of a survey that had been made throughout the country by engineers it was estimated that within the next ten years the output of electricity in this country would be multiplied by 2½ to 3 times. It was really extraordinary that within the short time the Commission had been in being amongst local authorities it had to deal with 1,700 applications for loan grants.

Although it was only natural that electrical contractors should wish to carry out large contracts, he would put in a plea for the smaller premises. With the electrification of railways it should be possible to extend to rural districts electrical manufactures. This would go a long way to help the architects in their national cause of encouraging the people to leave the towns and settle in healthy country districts.

After Dr. Alex. Russell responded further for the guests the toast of "The Electrical Development Association" was proposed by Mr. H. Marryat and seconded by Mr. W. B. Woodhouse.

In conclusion, Mr. H. T. Young proposed "The Chairman," to which Mr. R. Robson briefly responded.

NEWCASTLE BUILDING TRADES' ASSOCIATION.

MR. THOMAS BERTRAM occupied the chair at the annual dinner of the Newcastle and Tyne District Building Trades' Employers' Association held on January 11.

The Building trade was submitted by Ald. Bramble, who said it was an industry they all wished to encourage. He spoke in appreciative terms of the work of the Association, whose activities were for the good of both the industry and the public, stabilising the trade, and creating harmony between employers and employees. He felt sure if there were fewer official restrictions and more freedom the industry would get along a good deal better.

Replying, the President made reference to building charges, and said 1914 costs would never return in the time of those present. During the next six years costs in the building trade would be between 60 and 75 per cent. above 1914. These facts must be appreciated and looked fairly in the face, and from a business standpoint. There was a more settled state in the industry which warranted the hope that in a short time the cogs would be moving considerably more rapidly than at the moment. The advances in wages just awarded on the sliding scale meant a return to first-class work, and there was no possibility of wages coming down. The building trade would now get away from a class of building which some of them did not consider exactly creditable to the industry—the building erected under stress of circumstances.

Replying, Major Steele said he thought every builder would like to go back to the times when craftsmanship was a pride. Owing to the commercialism of the last half century he was afraid craftsmanship as an art had declined, but he prophesied a return from signs of the present day.

TENDERS.

Received Too Late for Classification.

CATHERINGTON.—For Cowplain Water Scheme, for the R.D.C. Mr. G. C. Vernon-Inkpen, architect, 40, Commercial-road, Portsmouth:—

F. J. Privett, Portsmouth	£7,977 0 0
F. Bevis, Portsmouth	6,373 0 0
Gunn McNeill, Ltd., Westminster	6,300 0 0
The Lux Solis Lighting Co., Earley Station	5,960 14 3
C. E. Harvey, Prinstead, Emsworth	5,433 11 0
J. Hunt, Gosport	5,400 0 0
H. H. Barry, Nottingham	4,945 0 0
The Standard Construction Co., Swansea	4,866 10 4
P. Trentham, Ltd., London	4,732 15 0
H. Osman & Co., Shirley, Southampton	4,622 16 0
Crawford Bros., Havant	4,612 17 6
J. Croad, Portsmouth	4,600 0 0
*A. Streeter & Co., Ltd., Godalming	4,097 15 2

CHADWELL HEATH.—For erection of house and shop, for Mr. Robinson. Mr. E. Meredith, architect, 7, Goodmayes-road, Goodmayes, Essex:—

T. L. Hughes, Ltd., Ilford	£1,490
Luton & Sons, Stratford	1,468
Baker, Hammond & Laver, Rainham	1,272
*Romain & Sons, Chadwell Heath	1,249

GOLDER'S GREEN.—For erection of house, for Mr. Tozer. Mr. E. Meredith, architect, 7, Goodmayes-road, Goodmayes, Essex:—

Tavener & Son, London	£1,770
W. J. Lovell & Son, London	1,735
*H. J. Gower, Ltd., London	1,497

GOLDER'S GREEN.—For erection of six houses (and/or two lock-up garages) corner of Elmcroft-crescent and Hamilton-road:—

	Six houses.	*Two garages.*
G. E. Scutt	£6,500 ..	—
Guild Housing, Ltd.	6,160 ..	256
H. J. Glibert & Sons	5,500 ..	250
W. A. Taylor	5,400 ..	225
Richardson & Howard	4,549 ..	185
F. W. Romain & Sons	4,457 ..	—
Allen Fairhead & Son	4,141 ..	195
Thatcher & Pritchard	3,960 ..	153
*J. E. Billings	3,695 ..	179

THE PRINCIPLES AND PRACTICE OF ESTIMATING.

WE give the following extracts from a paper on this subject read by Mr. T. SUMNER SMITH, F.S.I., before the Institute of Builders (Manchester Branch) on January 14:—

In considering the principles and practice of estimating in building works, we shall begin with the assumption that anyone desirous of acquiring the art and science of estimating is already equipped with a sound knowledge in construction, familiar with materials and their usages, and their conversion from the raw state to the finished product (except in those instances where they are a manufactured article, as, for example, bricks, cement, and the like, when he should be acquainted with their application to building works), also that he is conversant with craftsmanship and the methods employed in the execution thereof, and the amount of work a man is capable of performing in a given time, and finally, he is fairly well grounded in the principles and practice in the measurement of artificers' work. To those qualifications might also be added a sense of judgment of values. But this is largely a matter of experience, founded upon a catholicity of knowledge derived from amongst others, observation, induction, empirical comparisons of things of similar or like kind, always with an eye as to their costs, and also with a due sense of proportion of the fitness of things in their relation to one another. As to this, he would never compare, say, the price per cubic yard of concrete used in great bulk in which there had been facilities for handling and execution with that of a small quantity in which the conditions were the reverse—no proportion betwixt them as regards value.

The principal methods of estimating may be said to be two:—

(1) Pricing from correctly ascertained data of a like kind; (2) Pricing from data of a like kind, confirmed and checked by empirical methods founded upon experience.

The former may be taught and learned just as any other subject, and presents no great difficulties. The latter is more difficult to teach and learn; but it is possible, bearing in mind that anything may be taught successfully when its application is understood and that it may be acquired by the right aptitude and industry.

Both are somewhat similar, but the difference is in the kind of experience.

Analysis.

Of the essential principles underlying estimating for building works analysis is one of the most important. Particularly so does estimating call forth for this, since by our system the modes of measurements are expressed, as a general rule, for artificers' work, in terms different from the purchase terms of materials; further, artificers' work may be composed of several and distinct kinds of materials whose values differ, and it may sometimes happen that their purchase terms differ. Take the example of a cubic yard of cement concrete. It is invariably made up of broken bricks or stone, shingle or gravel, ashes or coke breeze, or slag, together with sand and cement and water. The purchase terms of broken bricks, etc., and sand may either be by weight or by volume, whilst the purchase term of cement is by weight, and that of water by the gallon. And the value may vary in each case, even though bought on the same purchase terms. Similarly, there may be various kinds of labour employed whose rates of remuneration differ. Then, again, railway rates and cartage rates may vary—the price per ton of sand will obviously be less than the price per ton of cement, as the latter may require protection from inclement weather.

Also, although one may purchase sand at a rate on the terms of so much per cubic yard, the railway rate is invariably that based upon the terms of so much per ton. Here, then, we have a simple commodity or compound article, cement concrete, which, on analysis, for the purpose of estimating, presents numerous problems for solution. Analysis, then, is the first step in arriving at the price.

Reverting to our example: a cubic yard of cement concrete, say, composed of 5 parts broken brick, one part sand and one part cement, I propose to examine in detail the problems as they present themselves, and to give illustrations of the methods by which they may be solved with a view of ultimately arriving at the price per cubic yard.

The quantities of materials required to make a cubic yard of cement concrete are an important factor of the cost. It would be wrong to assume that the quantity of broken bricks in this case plus the quantity of sand and quantity of cement is equal to the volume of the finished concrete. Thus, five cubic yards of broken bricks, one cubic yard of sand, and one cubic yard of cement will not make 7 cubic yards of cement concrete since the grains of sand and cement fill, to a certain extent, the spaces or voids between the broken bricks. It is also incorrect, on the other hand, to assume the quantity of broken bricks alone as being exactly equal to the volume of the concrete, because the introduction of sand and cement may be in excess of the actual voids. Further, it is also incorrect to assume that the quantity of broken bricks must be either less or exactly equal to the volume of the finished concrete, because it depends upon whether the amount of sand and cement introduced is equal to the actual voids. In the example I have given the broken bricks amount to 1.2 or 1 1-5th cubic yard in volume to the finished cubic yard of cement concrete. To the beginner this may seem paradoxical, but as to this I will make clear later. Suffice it to say, it will have served the purpose of the illustration if it should have aroused your curiosity and have prompted you to argue a question in your mind as to how or why is it feasible to pack 1.2 cubic yards of materials into one cubic yard. And by this it will now be understood what I meant when I stated previously that an estimator must cultivate an inquiring and critical mind. He should exercise well and keep alert the critical faculty. It is so essential that the beginner should at the outset grasp the fact that it is possible to put more materials by measure into a smaller measure that I shall illustrate it by a simile.

For my simile I shall take water as my illustration. Pure water at a given temperature—39.2 deg. F.—is at its greatest density, and one gallon weighs 10 lb., or 6.25 gallons or 62.5 lb. equals approximately one cubic foot. Water at its greatest density is neither expandible nor compressible, but by increasing the temperature to 212 deg. F. water is converted into steam, and 1 lb. of steam at this temperature at atmospheric pressure will occupy approximately a space of 26 cubic feet, and by increasing the temperature, say, to 394 deg. F. 1 lb. of steam will withstand or exert a pressure of 230lb. per square inch, and will occupy only 2 cubic feet of space. So that by increasing the temperature the same weight of steam will occupy less space, in this case 13 times less, only, of course, it exerts greater pressure. We may, for our purpose, eliminate the point about pressure. However, what I wish to impress upon you is this: that these are recognised and accepted facts. I cite them to show that dubiousness alone will not suffice, but rather that you must proceed along the lines of reason in solving your problem. Our first problem, therefore, in arriving at the quantity of materials in a cubic yard of cement concrete is that of voids. How are we to ascertain and determine the amount of voids?

Voids.

The determination of voids of a unit volume of aggregate has been ascertained in the past mainly by actual trial—by filling a watertight box (a convenient size is 4 ft. 6 in. by 3 ft. by 2 ft.=27 ft. cube=1 yard cube) well wetted to avoid further absorption, and measuring the volume of water it is necessary to pour in to fill up all the interstices. The voids in sand were determined and ascertained in a similar manner. In practice these void tests gave anything but satisfactory results. In the case of sand the moisture which the sand contains so affects its volume that this test is scarcely of any value. If the sand is dry, for example, a fine sand with grains of a uniform size will have about the same percentage of voids as a coarse sand with uniform grains; whilst, on the other hand, if sand when tested contains natural moisture, the amount of this varies so much from day to day that the original volume of the sand, and, in fact, the volume of the voids, may be affected to the extent of 10 per cent. An increase in the percentage of moisture increases the bulk of sand and likewise the voids up to a certain point. The correct way to determine the voids of a unit of aggregate or sand is to ascertain the specific gravity of the materials. The specific gravity of a substance is the ratio of the weight of a given volume to the weight of the same volume of distilled water at a temperature of 62 deg. F. For ordinary tests of aggregate and sand the water need not be distilled and may be at ordinary temperature—say from 60 deg. to 80 deg. For ordinary bricks the specific gravity is 1.90, and the weight per cubic foot 118 lb. The specific gravity of sandstone may be taken as 2.6 and the weight of a solid cubic foot 160 lbs. As a rule the voids in cement are not ascertained. Loose Portland cement averages per cubic foot about 92 lb., but when packed tight averages about 115 lb. Portland cement is assumed in standard proportions to weigh 100 lb. per cubic foot

Specific gravity multiplied by 62.32=weight of a cubic foot in pounds. Therefore weights of aggregate or sand divided by 62.32 gives specific gravity.

Analysis showed that in a yard of 7:1 concrete there was .728 of a cubic foot of solid matter in excess, approximately 2.6 per cent. without considering the volume occupied, if any, by the water used in mixing. But in practice it is reasonable to assume that not every particle of solid matter is actually used. Quitting for the moment the point with reference to water, we can only say that this 2.6 per cent. is greater or less waste than is required by actual tests, either in the form of research or data derived from actual operations. Some waste will actually take place. Hence, the estimator must know this, to estimate accurately.

As regards water: what is the quantity required for a cubic yard of concrete? Does this vary with the temperature, the dryness and density of the materials? Again, does the cellular construction of the materials have any effect upon the quantity of water required? All these are matters awaiting investigation. Further, does an excessive amount of water weaken concrete, and, conversely, an absence of a correct quantity diminish the strength of concrete? We know that concrete sets a conglomerate mass physically as a result of the hydration of the cement. What causes the cementitiousness of the mass into a conglomerate whole remains as yet a mystery. We even as yet do not know whether the water combines chemically and consequently occupies no space in the mass; if, on the other hand, it retains a separate entity, then on evaporation the concrete would be honeycombed to the extent of the space occupied by the water used in mixing.

Organisation.

Another factor that must be taken into consideration by the estimator is the matter of

organisation. I do not refer particularly to the organisation of men in the performance of task work so much as the organisation for getting the materials to the men. It is futile to estimate the labour cost from constants of labour or any data which gives the time of performance for a given task under certain conditions, unless those conditions will actually apply in the particular case under review. The first thing requisite is that the materials and the correct implements shall be at hand for the man to perform the task, and the next thing, whether it is possible for it to be done in the time which it is thought it ought to take to perform the task.

Pricing.

Of course, in pricing, the most difficult of all is that of determining the labour costs. The actual amount of materials to be used, their value, and all charges upon them may be estimated with accuracy to within reasonable limits. Not so the labour costs. We may by analysis calculate the materials, but analysis of labour costs will not help us materially, unless we have data of costings of similar works, and that they would be applicable to the case under review.

Summary.

Summarising, the principles of estimating necessitate the splitting up of an item into its component parts, and each unit treated separately for costs, and which should be in relation to its component parts where they are affected by relation thereto. Taking our illustration of excavation as an example, the percentage to be added for plant must be considered in relation to the class of work, as it is obvious were the item a piece of joinery work the cost of plant would be greater than 4 per cent.

Owing to our method of measurements we mix up materials with labour, with certain exceptions, notably stonework. This complicates matters and renders it difficult for the installation of a scientific system of investigation—by costing or other means—for arriving at the cost of the respective units or the component parts of an item. When such has been ascertained the data may be rendered useless by a fluctuation in cost of any one of its component parts. For instance, why should not excavation be considered apart from filling-in, and these quite apart from carting away, tips, fees, overhead charges, and profits?

Unfortunately, since we have to consider the price of an item of many parts we are compelled to base our price mainly upon assumptions, but this is even more reliable than lumping or guessing the price, or because we know that so-and-so price for such an item is 10s. we must cut it by one penny to get the job, whether we can do it at 9s. 11d. or not. Would it not be more sensible to see whether we could do it for 9s., and if we can let that be the price, then the bogey of competition is non-existent.

Conclusion.

In conclusion, a scientific study of pricing, seeing that it must of necessity take into consideration a review of the whole field of operations, may ultimately lead to a reduction in costs, whilst at the same time it may not only assume profits but benefit the country in general by a reduction in the cost of building and engineering works, and guarantee better wages.

Concrete is now used in building, and engineering works beyond the dreams of those of 30 years ago, but it is as yet only in its initial stages. The study of the uses of concrete and its costs may effect many savings. For example: It is possible to reduce the time of setting of concrete by 100 per cent., and at the same time increase its hardness and watertightness, with the result that buildings and engineering works, particularly roads, may be completed in much less time than it ever were possible before, and superior to anything known in the past.

RATES OF WAGES IN THE BUILDING TRADE.

The following are the rates of wages in the building trade in England and Wales. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Bricklayers.	C'p'ters. Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
Aberdare	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Accrington	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Altrincham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Ashton-under-Lyne	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Barnsley	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Barrow-in-Furness	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Barry	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bath	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Bedford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Birkenhead	1/9	1/9	1/8½	1/9	1/9	1/9	1/8½	1/4
Birmingham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bishop Auckland	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Blackburn	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Blackpool	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bolton	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Bournemouth	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Bradford	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Brentwood	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Bridgwater	1/3	1/3	1/3	1/3	1/3	1/3	1/3	0/11½
Brighton	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Bristol	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Burnley	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Burton-on-Trent	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Bury	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Cambridge	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Cardiff	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Chatham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Chelmsford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Cheltenham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Chester	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Chesterfield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Colchester	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Coventry	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Crewe	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Darlington	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Derby	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Doncaster	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Dudley	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Durham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
E. Glam.(Mon. Vall.)	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Eastbourne	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Exeter	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/3½	1/0½
Folkestone	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	0/11½
Gloucester	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Grantham	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Grays	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/2½
Grimsby	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Great Yarmouth	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Guildford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Halifax	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Harrogate	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Hartlepools	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Hastings	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	0/11½
Hereford	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Huddersfield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Hull	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Ipswich	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Lancaster	1/6	1/6	1/6	1/6	1/6	1/3	1/6	1/1½
Leamington Spa	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Leeds	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Leicester	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Lichfield	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Lincoln	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Liverpool	1/9	1/9	1/8½	1/9	1/9	1/9	1/8½	1/4
Llanelly	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
London	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/2½
Loughborough	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Luton	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Maidstone	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Manchester	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Mansfield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Merthyr Tydfil	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Middlesbrough	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Newcastle-on-Tyne	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Newport, Mon.	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Northampton	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Norwich	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Nottingham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Oakham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Oldham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Oxford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Plymouth	1/6	1/6	1/6	1/6	1/6	1/6	1/5	1/1½
Pontypridd	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Portsmouth	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Preston	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Reading	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Rochdale	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Rochester	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Rugby	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
St. Albans	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
St. Helens	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Scarborough	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Sheffield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Shrewsbury	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Southampton	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Southend-on-Sea	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Southport	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
South Shields	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Stockport	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Stockton-on-Tees	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Stoke-on-Trent	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Stroud	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3	0/11½
Sunderland	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Swansea	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Swindon	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Taunton	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	0/11½
Torquay	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Tunbridge Wells	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Wakefield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Walsall	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Warrington	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
West Bromwich	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Wigan	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Windsor	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Wolverhampton	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Worcester	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
York	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2

(For rates of wages in the Building Trade in Scotland, see page 123).

CENTRAL LANDOWNERS' ASSOCIATION AND THE RATING BILL.

THE Central Landowners' Association has issued a Memorandum relating to the Rating and Valuation Bill submitted for their consideration by the Minister of Health, and from the report published in the *Times*, January 9, it appears that the Association accepts the main principles of the Bill, but on the understanding that it is regarded as a first step towards comprehensive rating reform, which shall review the relations between local and Imperial taxation, and it urges the Government to make some authoritative pronouncement on the lines upon which they propose to deal with this further and most urgent problem as soon as possible after the Bill has passed. The abolition of parochial rating is approved, but doubt is expressed as to whether economy will be effected.

The Memorandum is a long one and we only intend noticing certain points: for instance, the Association regrets the proposal to continue and extend the provision for rating owners instead of occupiers in rural as well as urban districts, and urges that no expedient short of direct payment of rates can bring their weight home to the occupier and so help to secure economy in local expenditure.

This, no doubt, refers to clause 8 subclause (1) in the Bill, which makes it lawful for any rating authority by resolution to direct in the case of any hereditament to which this subclause applies that the owners shall be rated instead of occupiers and by subclause (3) the hereditaments included are "all hereditaments, not being agricultural land within the meaning of the Agricultural Rates Acts, 1896 and 1923, the rateable value of which does not exceed thirteen pounds or in respect of which a weekly rent is payable, and for the purpose of the foregoing provisions of this section the expression 'hereditament' includes in any case where parts of a building are assessed separately the parts so assessed."

There can be little doubt that the rating of owners in place of occupiers is a bad principle for more than one reason. The local electorate should have it brought home to them that local expenditure is reflected in the rates, and that lavish expenditure means high rates. If the landlord pays the rates in the first instance, not only is this fact lost sight of but the occupiers confuse rates with rent, and attribute increased rents due to high rates entirely to the landlord and consider he is making extortionate demands for rent.

As regards Part II of the Bill the Memorandum accepts the general principle underlying this part of the Bill, "viz., that in each area the aggregate cost of the various public services for which the area is responsible should be equally distributed among the ratepayers on the basis of a single uniform valuation," but as regards the centralisation of valuation areas the Memorandum suggests that in practice much will depend upon the scheme which will be "settled by the Minister." We understand this to mean the schemes to be submitted by the County Councils to the Minister for his approval under clause 11. The Association in this connection observes that the inconvenience and expense to which the ratepayer may be put who desires to object to the valuation list will depend more on the schemes as settled than upon the provisions of the Bill. As regards the proposed quinquennial revaluation which is to be adopted throughout the country on the system in operation in London, the Memorandum points out that that system has been modified by certain judicial decisions and the new Bill contains no definitions as to what may or may not be taken into consideration in revaluation so the system proposed is an intensification of the present London system.

The Association accepts the principle of gross value for rating being conclusive evidence of gross value for income tax, but whilst admitting that this must involve the participation to some extent of revenue officers in the settlement of valuation lists, deprecates the proposal that a rating authority (but not an assessment committee) may employ a person in the employ of the service of the Inland Revenue to make valuations. On this point the Memorandum states, "The Association strongly objects to this proposal, which seems to point to the State-encouraged employment by rating authorities on a large scale of officials of the valuation department of the Inland Revenue. On general public grounds they suggest that it is undesirable that such persons who are servants of the Crown should in effect be put into the position of expert witnesses. Cases would inevitably occur in practice in which in forming their opinion they consciously or unconsciously would be making use of information which had come to them in their official capacity in circumstances which would make the use of it by them a breach of confidence and they would thus be placed in a position of great difficulty. It is also inevitable that in view of past history this proposal will be regarded by a large section of the public as an attempt to bolster up a Department the original and main object for the establishment of which has disappeared."

Objection is taken in the Memorandum to the scheme for fixing deductions from gross values in respect of maintenance and the Association suggest the system authorised by the Finance Act of 1923 allowing deductions varying in percentage with the annual values of the properties should be adopted.

This point is connected with the whole question of accepting one valuation for the double purpose of rates and taxes, and the Association points out in connection with this question of deductions: "Another aspect of the matter and one which causes this question of the acceptance of the principle that gross value for rating be accepted as conclusive evidence of gross value for income tax to be closely bound up with the fixation of the maintenance deduction, is that while rates are concerned with real property only, taxes are concerned with real and personal property. For income tax purposes it is essential that the net figure upon which the tax is levied in the case of income from real property should be reduced to the same level as the net figure upon which the tax is levied in the case of personal income, *i.e.*, in order that like may be compared with like, *e.g.*, income from real property be compared with a salary."

Our readers will remember that Sir Trustram Eve, in a letter to the *Times*, November 19, noted some objections to the introduction of one assessment for both rates and taxes, and amongst these objections were first that it involved bringing the Inspector of Taxes or the Revenue Officer into the preparation of valuation lists, and secondly that the ideal aimed at by this system was wrong in itself, for "the underlying idea of Schedule A is a tax on the owner arising from the rent received, or its equivalent, from real property. The fairness or unfairness of Schedule A lists affects no one but the State and the owner. A local rate is a charge on the occupier and the annual value of the premises is by common consent taken as a token of his ability to pay for benefits received from certain expenditure of a beneficial nature to occupiers within a prescribed area, such as collection of dust, the service of water supply, disposal of sewage, education, roads, police, &c. It is most essential that for local rates occupiers of similar premises should be charged equally, and that all the annual values within that district should be fair one with another and on the same basis. In the case of Schedule A this is not necessary. There is a great difference in fact between rents and annual values. It is not possible in practice (especially in these days of extraordinary post-war values) to make a valuation list containing assessments which are fair for rates and yet conform to the practice of Inspector of Taxes or Revenue Officer for Taxes."

As regards the valuation of special properties such as railways, the Memorandum states that the principles to be applied and the formulæ to be adopted are so bound up with the consideration of the whole subject embraced by this Bill that if the scheme as regards these properties is deferred as is proposed, the Bill may be taken to have been accepted, whilst it is impossible to foresee the result of the proposals, and the Association therefore suggests that the present proposal shall be reversed and the provisions as to special properties be introduced first and passed subject to a suspensory provision that they shall not come into operation until the central authority is set up.

We have only referred to some of the points raised in this Memorandum.

A summary of the views expressed by the Association of Poor Law Unions on this Bill will be found in our issue, December 14 last.

PATENTS.*

APPLICATIONS PUBLISHED.*

205,752.—W. A. Williams and North British Rubber Co., Ltd.: Rubber paving and flooring blocks or slabs.

183,475.—J. Mugica: Method or process of asphalting by means of continuous strips of compressed reinforced asphalt.

193,006.—C. Didier: Method of protecting and rendering impermeable materials employed in construction.

192,372.—G. Lyon: Apparatus for seasoning wood.

205,848.—Williams, Gamon & Co. (Kaleyards), Ltd., and G. P. Gamon: Stay-bar fasteners for casement windows.

205,879.—J. F. Downing: Double water-trapped gullies.

205,887.—W. J. Mellersh-Jackson (W. E. Hacker): Bituminous concrete pavements.

205,932.—Wynn, Timmins & Co., Ltd., and W. F. Vanhagen: Heads of hammers, adzes and axes.

205,943.—E. M. Lawrence and G. T. Richardson: Safety plates for door or like locks.

205,970.—J. T. McNay: Reinforcements for concrete.

206,014.—G. Kelting, J. A. Webberley and J. Adams & Son, Ltd.: Door springs.

206,096.—A. Cabla: Pivoted sliding double windows.

200,094.—A. A. R. Fastborg: S-shaped hooks for holding together the roofing tiles in tiled roofs.

206,100.—J. T. Whittome: Sash windows.

206,604.—A. F. Shirreff: Load-lifting devices.

206,614.—Parker, Winder & Achurch, Ltd., and J. A. Wood: Operating devices for fanlights or other pivoted windows.

206,617.—A. D. Tipper and F. T. Taylor: Manufacture of door latches.

206,643.—W. A. Vaughan: Bricks, tiles and the like.

206,669.—M. Heymann: Metal coverings for walls and ceilings.

206,731.—J. Haag: Locks.

206,742.—R. Y. Ames and G. G. Scott: Roofing-tiles.

206,752.—A. H. Wilkes: Door springs and checks.

193,829.—F. Guy and M. L. Davey: Composition for use in the manufacture of concrete structures.

206,765.—R. Dixon: Sheet-metal buildings.

196,266.—J. C. Chevers: Metallic sheet for lining ceilings, walls, and other parts of structures.

206,173.—C. Kindstrom: Hollow building-blocks.

206,201.—A. Williams: Compositions for coating and producing texture and other decorative effects on plaster, "compo," asbestos sheeting, wood, iron and cement.

206,247.—H. A. Rimmer: Paint.

206,256.—G. D. Peters & Co., Ltd., and A. Brackenbury: Ventilators.

* All these applications are now in the stage in which opposition to the grant of Patents upon them may be made.

RIGHT OF WAY: COVENANTS TO CONSTRUCT ABANDONMENT.

IN a recent case, Swan *v.* Sinclair (*The Times*, December 21), an interesting point was raised as to a right of way. In 1871 a row of houses and shops were put up for auction in eleven lots and one of the conditions of sale was that a strip of land 15 ft. in width at the rear of the back gardens of the lots should be formed into a roadway and the conditions prescribed that each purchaser should as soon as possible contribute to form the roadway and remove that portion of the garden fences which traversed this strip of land and the original conveyances to the several purchasers provided that the several lots were subject to and had the benefit of the intended roadway and subsequent deeds expressly referred to this right. The plaintiff had acquired the freehold of lots 2 and 3 in 1911 by a conveyance which expressed that the lots had the benefit of this roadway. His father in 1873 had acquired a lease of plot 1 from an original purchaser with covenants relating to the roadway, which would expire in 1922 and in 1883 he had levelled up the garden at the rear of that plot, so that over the prescribed strip of land for the roadway it was higher than the gardens of the adjoining plots. The plaintiff had become the leaseholder of lot 1 in 1904, by assignment of this lease, and in 1919 he had levelled up the end of plots 2 and 3 to the level of lot 1 and he intended to build a garage on those two plots with an exit to a road which ran as we gather at right angles at the further side of plot 1, and he had pulled down a wall which separated lot 1 from that road for that purpose and erected gates. When the lease of plot 1 determined the defendant had acquired the freehold of plot 1 and he (the defendant) had then erected a wall across the strip of land between that plot and plot 2, thus barring access from the rear of plots 2 and 3 to the road. The plaintiff then brought this action claiming a right of way along the strip.

It was proved in the Court below that from 1871 until 1922 no step had been taken to form the roadway and the fences running across the strip had never been removed, and the Court below had held that as the roadway had never been formed and the strip of land had always been obstructed and the plaintiff and other owners had acquiesced the easement had been abandoned. Further, the Court held that the conduct of the plaintiff's father in levelling up plot 1 across the strip thus creating a drop between that plot and plot 2 was not consistent with the right claimed by the plaintiff.

The Court of Appeal by a majority affirmed this judgment, but the Master of the Rolls (Sir Ernest Pollock) dissented from the judgment. All the members of the Court seem to have relied upon an old case, Ward *v.* Ward (7 Exch. 839), from which the following passage was cited in the judgment of Lord Justice Warrington: "The presumption of abandonment cannot be made from the mere fact of non-user. There must be other circumstances in the case to raise that presumption. The right is acquired by adverse enjoyment. The non-user therefore must be the consequence of something adverse to the user."

From the fact that not only had the user of the road been rendered impossible by the continuance of obstructions existing at the date of the grant (that is, the fences and at least one brick wall) but also by the creation of a fresh obstruction in 1883 (that is, the raising of the garden at the rear of plot 1 to a higher level and the building of a retaining wall), the majority of the Court held the presumption was raised not merely that the right was in abeyance and capable of being revived, but that it had been abandoned and had ceased to exist. The Master of the Rolls is reported to have held that circumstances had induced upon all the owners a common delay, and inactivity was not sufficient to justify abandonment being presumed nor was non-interference with what was done in 1883 by the owner of plot 1 a clear indication of an intention to abandon the right, as at that time the road was not in being and therefore there could be no cessor of user.

There appears to be a lack of authority by legal decisions on the point raised in this case, and yet it is an extremely important one to purchasers of house property. The duty to make this road was a burden upon each of the lots sold at the auction and would continue so until the abandonment could be proved. Would any layman purchasing one of these houses fifty years after the original sale and finding that the road had not been made in all that period, imagine that the obligation contained in the purchase deeds still continued? If any such question did cross his mind, would he not consider the right both dead and literally buried when he found the level of the proposed roadway had been raised six feet behind one of the houses at least?

But perhaps the most extraordinary part of the case is that the defendants predecessor in title was the plaintiff's father, and he had first obstructed the strip by raising his garden in 1883, whilst the plaintiff himself had also subsequently altered the level, so far as all the other houses were concerned, by also levelling up the ground behind his two houses to this higher level, rendering the strip of land more suitable for a "switchback" than for a road.

It is satisfactory to see that the majority judgment finds this alteration in 1883 only twelve years after the original grant, a fact on which presumption of abandonment could be founded.

THE RENT ACTS: POSSESSION.

UNDER the above heading in an article in our issue for November 9 we dealt with section 5 of the Act of 1920, which has now been superseded by section 4 of the Act of 1923, with the view of showing the amendments which have been introduced, as this is one of the most important sections in the Acts. Paragraph (d) has been very drastically amended, and it was our intention to show these amendments by italicising that portion of the old paragraph which had become incorporated with the new matter, but in the passage of the article through the Press an error was made, or it had not been clearly indicated what portion should be italicised, and as this may give an erroneous impression of the amendments introduced we revert to this paragraph, showing how the matter really stands.

In the Act of 1920 this paragraph stood, "The dwelling-house is reasonably required by the landlord for occupation as a residence for himself or for any person *bona fide* residing, or to reside with him, or for some person in his whole-time employment, or in the whole-time employment of some tenant from him and (except as otherwise provided by this subsection) the Court is satisfied that alternative accommodation reasonably equivalent as regards rent and suitability in all respects is available."

The new paragraph reads as follows: "The dwelling-house is reasonably required by the landlord for occupation as a residence for himself, or for any son or daughter of his over 18 years of age, or for any person *bona fide* residing with him, or for some person engaged in his whole-time employment, or in the whole-time employment of some tenant from him, or with whom conditional on housing accommodation being provided a contract for such employment has been entered into, and (except as otherwise provided by this subsection) the Court is satisfied that alternative accommodation is available which is reasonably suitable to the means of the tenant and to the needs of the tenant and his family as regards extent, character, and proximity to place of work, and which consists either of a dwelling-house to which this Act applies, or of premises to be let as a separate dwelling on terms which will afford to the tenant security of tenure reasonably equivalent to the security afforded by this Act in the case of a dwelling-house to which this Act applies."

The paragraph was correctly set out in our former article, but the portions of the old paragraph which were retained were not correctly indicated by the italics. Now that the character of alternative accommodation has been so much amplified, those cases in which it is declared that its existence "shall not be a condition of an order or judgment on any of the grounds specified in paragraph (d)" require careful consideration, and in particular the distinction created by paragraphs iv. and v. of section 4 subsection (1) between cases where the landlord became the landlord before June 30, 1922, or where he became landlord after that date has caused some correspondence in the Press.

In the former case the paragraph says the dwelling-house must be reasonably required by the landlord as a residence for himself or for any son or daughter of his over 18 years of age, whereas in the latter case not only must the house be so reasonably required, but the Court has to be satisfied that greater hardship would be caused by refusing to grant an order or judgment than by granting it. As we pointed out in our former article, the general discretion contained in the subsection at the end of the first nine paragraphs "and the Court considers it reasonable to make such an order," applies apart from the specific question of alternative accommodation, but from a letter from one of the County Court Judges which appeared in the *Times*, November 26, it would appear that in some Courts a difficulty has been experienced in excluding the question of alternative accommodation from the general discretion, and the writer of the above letter points out that this may render nugatory the provisions of the new Act, and he gave instances of how in his opinion the discretion should be exercised.

No hard and fast rules can be laid down upon a matter of discretion for if they are too rigidly enforced they are destructive of discretion.

In the first case, where the landlord was landlord before June 30, 1922, there is no mention of the tenant, the house has only to be "reasonably required for occupation," but in the second case, where the landlord has become landlord after that date, it is to be observed the Court has to be satisfied that greater hardship would be caused by *refusing* to grant an order than by granting it.

In the first case, reasonableness in the desire of the landlord, there is not much difficulty, and the Judge, the writer of the above letter, gives some practical suggestions; but the second case presents some difficulty, for how can the Court determine which is the greater hardship without considering the question of the alternative accommodation? The hardship of refusing the order has to be greater to the landlord than the tenant, and thus the position of the two parties must be weighed, and although in considering this question alternative accommodation must not be a condition of making the order, yet in considering the position of the tenant it must form an element in the conclusion arrived at. The writer of the above letter hardly seems to us to have solved this difficult question as regards this second case.

Builders' Wages.

A decision was made on January 10 by the National Wages and Conditions Council to increase the wages of employees in the building industry on and from February 1, in accordance with the sliding-scale agreement, which provides that the rates of wages shall be adjusted half-yearly by ½d. per hour in respect of each complete average variation of not less than 5½ points in the cost of living index figure. The following resolution was passed:—"That on and from February 1 the rates of wages payable to craftsmen shall be increased by one halfpenny per hour, and that the hourly rates payable to labourers shall be not less than 75 per cent. of the craftsmen's rates, calculated to the nearest farthing."

It was also agreed to regrade a number of towns throughout the country, which will mean an increase additional to the ½d. under the sliding scale for those workers in the towns affected.

The application of the Operatives' Federation for the readjustment of the base rate, or starting-point, of the sliding scale, to give the men an automatic increase of 2d. per hour, will be considered at the next meeting of the Council.

CONTRACTS, COMPETITIONS, &c.

For some contracts still open, but not included in this List, see previous issues Those with an asterisk are advertised in this number. Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in; the name and address at the end is the person from whom or place where quantities, forms of tender, &c., may be obtained.

BUILDING AND PAINTING.

✱JANUARY 18.—**Croydon.**—COTTAGE.—Erection of a cottage at Russell Hill Reservoir, Pampisford-road, Croydon, for the County Borough Council of Croydon. Borough Engineer, Town Hall, Croydon. Deposit £1.

JANUARY 19.—**Cheltenham.**—PAINTING.—For painting part of Municipal Offices, for the T.C. Borough Engineer, Cheltenham.

JANUARY 19.—**Ipswich.**—REPAIRS.—For repairs to school buildings, for T.C. Mr. E. T. Johns, surveyor, 8, Lower Brook-street, Ipswich.

JANUARY 19.—**Irchester.**—HOUSES.—Erection of six houses, for the Irchester Industrial and Provident Co-operative Society, Ltd. Mr. E. A. Taylor, Managing Secretary, Irchester.

JANUARY 19.—**Nelson.**—HOUSES.—Erection of 19 houses of the non-parlour type in blocks as follows:—8 blocks of two and one block of three at the Marsden Park Housing site, for the Housing Committee of the Borough of Nelson. Borough Surveyor, Town Hall, Nelson. Deposit £2 2s. for each trade specification.

JANUARY 19.—**Perth.**—HOUSES.—Erection of five tenements of dwelling-houses, comprising 52 two and three apartment houses, for the T.C. Mr. Thomas M'Laren, Burgh Surveyor, 16, Tay-street, Perth. Deposit £1.

JANUARY 19.—**Rotherham.**—HOUSES.—For erection of 50 houses on Eastdene Estate, for T.C. Mr. C. A. Broadhead, Housing Architect, St. George's Hall, Rotherham. Deposit £2 2s.

JANUARY 19.—**St. Helens.**—ALTERATIONS.—For alterations and additions to Boundary road Baths, for the T.C. Mr. Arthur W. Bradley, Borough Engineer, Town Hall, St. Helens. Deposit £2.

JANUARY 19.—**Stocksbridge.**—HOUSES.—Erection of 20 houses on the Shay House-lane site, for the U.D.C. Mr. J. N. Singleton, surveyor, Stocksbridge. Deposit £2.

JANUARY 19.—**Warrington.**—SCREENS.—For supply of manual instruction wood screens to various schools, for T.C. Mr. J. Moore Murray, Secretary, Education Office, Sankey-street, Warrington.

JANUARY 21.—**Bathgate.**—HOUSES.—Erection of two groups of houses (32 three-apartment houses and 20 two-apartment houses), for the T.C. Mr. Will. Allan, Town Clerk, Town Clerk's Office, Bathgate.

JANUARY 21.—**Bury St. Edmunds.**—HOUSES.—Erection of four houses in Mustow-street, for the T.C. Mr. Roland H. Beaumont, Borough Surveyor, Town Hall, Bury St. Edmunds. Deposit £2 2s.

JANUARY 21.—**Fermoy.**—HOUSES.—Erection of 8 dwellings, for the U.D.C. Clerk, Fermoy.

JANUARY 21.—**Hastings.**—STEEL CONSTRUCTIONAL BUILDINGS, &c.—Steel constructional buildings, steel plate coal bunkers and chutes, reinforced concrete pond and plant foundations required for the Electrical Department by the County Borough Council of Hastings. Borough Electrical Engineer, 20, South-terrace, Hastings.

JANUARY 21.—**Mallaranny, Ireland.**—REPAIRS.—For repairs, &c., at Mallaranny Hotel, co. Mayo, for the Midland Great Western of Ireland Co. Sec., Broadstone Station, Dublin.

JANUARY 21.—**Reigate.**—NEW LAUNDRY AND EXTENSION OF BOILER HOUSE.—Erection of a new laundry and extension of the boiler house at the Guardians' Institution, Earlswood, for the Reigate B.G. Mr. O. J. Porter, F.S.I., 45, Bedford-row, W.C. 1. Deposit £2 2s.

JANUARY 21.—**Southend-on-Sea.**—HOUSES.—Erection and completion of 66 houses, comprising 26 parlour type and 40 non-parlour type, in the following blocks:—One block of 2 houses, 1 block of 3 houses, 6 blocks of 4 houses, 5 blocks of 6 houses, 1 block of 7 houses, for the Corporation of Southend-on-Sea. Mr. Robert H. Dyer, Borough Engineer, Municipal Building, Southend-on-Sea. Deposit £2.

JANUARY 21.—**Truro.**—RECONSTRUCTION.—For the reconstruction of the Royal Printeries and alterations to shop front, &c., at Truro, for Mr. Oscar Blackford. Messrs. Cowell, Drewett, & Wheatly, architects, 11, Princes-street, Truro. Deposit £2 2s.

JANUARY 22.—**Acton.**—ALTERATIONS.—For alterations and additions to hut at cemetery, Willesden-lane, for T.C. Borough Surveyor, Municipal Offices, Acton, W.3.

JANUARY 22.—**Bute.**—HOUSES.—(1) Erection of house on Kerrycrusach Farm, County of Bute, 2½ miles from Rothesay, and (2) house on Goltans Farm, 2 miles from Rothesay. Chief Surveyor, Board of Agriculture for Scotland, Edinburgh. Deposit £1 1s.

JANUARY 22.—**Edinburgh.**—LAIRAGES, &C.—(1) Lairages for imported cattle at the Cattle Markets, Gorgie, and (2) bench walls opposite North-West Section of Greyfriars' Churchyard, for the T.C. City Architect, Public Works Office, City Chambers, Edinburgh.

JANUARY 22.—**Edmonton.**—FLOORING.—For flooring over the first-class swimming-bath, in the Public Baths, Knight's-lane, for the U.D.C. Mr. Cuthbert Brown, Engineer, Town Hall, Edmonton, N.9.

JANUARY 22.—**Fowey.**—BUNGALOW.—Erection of a bungalow at Lankelly-road, Fowey, for Capt. Fred Collins. Mr. W. T. H. Northcote, surveyor, Fowey.

JANUARY 22.—**Glamorganshire.**—VARIOUS WORKS.—(1) Tynyrheol School (Llangeinor, Garw Valley), additional classrooms; (2) Pontlottyn Boys' Council School, minor alterations; (3) Port Talbot Secondary School, new science block; (4) Tonna Council School, conversion of offices and drainage; (5) Llangyfelach Council School, repairs. Mr. Henry D. Rowland, Assistant Secretary of Education Committee, Glamorgan County Hall, Cardiff.

JANUARY 22.—**Kilkeel, Ireland.**—HOSPITAL.—Erection of district hospital for Commissioner of Union. Mr. S. C. Hunter, quantity surveyor, 2, Wellington-place, Belfast. Deposit £2 2s.

JANUARY 22.—**Liverpool.**—SCHOOL.—Erection of new elementary school in New Hall-lane, Clubmoor, for the T.C. Land Steward and Surveyor (Architectural Dept.), Municipal Buildings, Liverpool. Deposit £2 2s.

JANUARY 22.—**Mile End.**—ALTERATIONS, &C.—For alterations and redecorations to the District Medical Officers' quarters at the Institution at Bancroft-road, E., of the Board of Guardians. Mr. Edmund J. Harrison, Lic.R.I.B.A., 23, Berkeley-road, Crouch End, N.8. Deposit £2.

JANUARY 22. — **Southall-Norwood.** — HOSPITAL, CUBICLE BLOCK, STABLES, COTTAGES.—(*a*) The erection of an eight-bed cubicle block at the Sanatorium, North-road, Southall; (*b*) the erection of a depot, stables and cottages at Adelaide Dock, Endsleigh-road, Southall, for the Southall-Norwood Urban District Council. Mr. J. B. Thomson, Assoc.M.Inst.C.E., &c., Engineer and Surveyor to the Council, Town Hall, Southall, at my office, between 10 and 4 p.m. (Saturdays 10 and noon).

JANUARY 23.—**Bath.**—HOUSES.—For the erection of 50 houses at Englishcombe Park, for the T.C. Mr. A. J. Taylor, architect, 18, New Bond-street, Bath. Deposit £1 1s.

✱JANUARY 23.—**Birmingham.**—HOUSES.—Erection of 287 non-parlour-type houses, and 134 parlour-type houses on the Brookvale Estate, Witton, under five contracts, Nos. 150, 151, 152, 153, and 154, for the Public Works and Town-Planning Committee of the City of Birmingham. Mr. Herbert H. Humphries, M.Inst.C.E., City Engineer and Surveyor and Executive Officer for Housing Schemes. The Council House, Birmingham. Deposit £2 2s.

JANUARY 23.—**Blackpool.**—CONVERSION.—For the conversion of the existing buildings in the Rigby-road Highway Depot into a laundry, for the T.C. Mr. Francis Wood, Borough Engineer, Town Hall-street, Blackpool. Deposit £2.

JANUARY 23.—**Bradford.**—WAREHOUSE.—For the enlargement of a warehouse in Canal-road, Bradford. Messrs. T. H. & F. Healey, architects, 42, Tyrrel-street, Bradford.

JANUARY 23.—**East Elloe.**—COTTAGES.—For the erection of 5 pairs of cottages in Whaplode Village, 4 pairs in Gedney Fen (Bells Bridge), and 2 pairs in Sutton St. James (Birds Drove), for the R.D.C. Mr. S. S. Mossop, Jun., Clerk, West End, Holbeach.

JANUARY 23.—**Hackney.**—PAINTING.—For painting exterior public baths, Lower Clapton-road, for the B.C. Mr. Norman Scorgie, Borough Engineer, Town Hall, Hackney, E. 8. Deposit £1 1s.

JANUARY 23.—**Manchester.**—ALTERATIONS.—For alterations at No. 31, Piccadilly, for the G.W.R. Co. District Goods Manager, 51, King-street.

JANUARY 23.—**Rochdale.**—HOUSES.—Erection of 50 houses on the Turf Hill Estate, for the T.C. Mr. S. H. Morgan, Borough Surveyor, Town Hall, Rochdale. Deposit £1 1s.

JANUARY 23.—**Tanderagee.**—COTTAGES.—Erection of four cottages in Tanderagee, Co. Armagh, for the Government of Northern Ireland. Secretary, Ministry of Finance, 15, Donegall-square West, Belfast. Deposit £1.

JANUARY 23.—**Worthing.**—FLATS.—For erection of (1) pair of flats in Charlecote-road; (2) an attendant's cabin in Denton-gardens, for the T.C. Borough Surveyor, Worthing.

JANUARY 23. — **Worthing.**—PAVILION.—Erection of a sports pavilion at Beach House Park, Worthing, for the Borough Council. Borough Surveyor, Municipal Offices, Worthing. Deposit £1 1s.

JANUARY 24.—**Camberwell.**—FLOORS.—For taking up and relaying sectional wood flooring, including platforms, barriers, joists, cradles, sills, &c., over the Swimming Baths at the various Public Baths of the B.C. Mr. William Bell, Borough Engineer, Town Hall, Camberwell, S.E.5.

JANUARY 24.—**Caterham.**—HOUSES.—Erection of 14 cottages on Queen's Park Housing Site, for the U.D.C. Surveyor, Council Offices, Caterham Valley. Deposit £1 1s.

JANUARY 24.—**Glasgow.**—PAINTING.—For (1) painter work; and (2) iron railings and gates, at Coplawhill Housing Scheme, for the T.C. Mr. J. Lindsay, Town Clerk, City Chambers, Glasgow.

JANUARY 24. — **Liverpool.**—TENEMENT DWELLINGS.—Erection of six tenement dwellings on the St. Augustine-street frontage of the Blenheim-street site, for the Housing Committee of the City of Liverpool. Director of Housing, Municipal Buildings, Dale-street, Liverpool. Deposit £2 2s.

✱JANUARY 24.—**London, E.**—ALTERATIONS AND REDECORATIONS. — Alterations and redecorations to the District Medical Officer's quarters at the Institution at Bancroft-road, E., for the Guardians of the Poor of the hamlet of Mile End Old Town. Mr. Edmund J. Harrison, Guardians' Architect, 23, Berkeley-road, Crouch End, N. 8 (from the 14th inst. up to the 22nd inst.). Deposit £2.

✱JANUARY 24.—**London, S.W.2.**—REPAIRS AND DECORATIONS.—Repairs and decorations to the Librarian's residence at the Tate (South Lambeth) Library, South Lambeth-road, S.W. 8, for the Metropolitan Borough Council of Lambeth. Mr. Osmond Cattlin, Borough Engineer, Town Hall, Brixton-hill, S.W. 2.

JANUARY 24.—**Ystradgynlais.**—HOUSE.—For erection of dwelling-house at Ystradgynlais (Glam). Mr. T. W. Thomas, 4, Canolrhiw Villas, Brecon-road, Ystradgynlais.

JANUARY 25.—**Liverpool.**—ALTERATIONS.—For alterations and additions to the Old Welsh Chapel, Crosshall-street, for the T.C. Land Steward and Surveyor (Architectural Dept.), Municipal Buildings, Liverpool. Deposit £2 2s.

BUILDING TRADE WAGES IN SCOTLAND.*

THE following are the present rates of wages in the building trade in the principal towns of Scotland. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Brick layers.	Carpenters. Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Brick Masons' layers	Plasterers' Labourers.
Aberdeen	1/7	1/8	1/7	1/8	1/7	1/7	1/4½	1/–	
Airdrie	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Alexandria	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2	
Arbroath	1/7	1/6	1/6	1/7	1/6	1/6	1/5	1/1	
Ayr	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Bathgate	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/1 to 1/2	
Blairgowrie	1/7	—	1/7	1/7	1/7	1/7	1/6½	—	
Bo'ness	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2	
Coatbridge	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Dumbarton	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2	
Dumfries	1/5	1/5	1/5	1/6	1/5	1/6	1/5	1/1 to 1/2	
Dundee	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Dunfermline	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Edinburgh	1/7	1/7	1/7	1/8	1/8	1/7	1/6½	1/2½	
Falkirk	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Fort William	1/7	1/6	1/6	1/7	1/6	1/6	1/6½	1/1½	
Galashiels	1/5	1/5	1/5	1/6	1/5	1/5	1/5½	1/1	
Glasgow	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Greenock	1/7	1/7	1/7	1/8	1/7	1/7	1/5½	1/1 to 1/2½	
Hamilton	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Hawick	1/5	1/5	1/5	1/6	1/5	1/5	1/5½	1/1½	
Helensburgh	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Inverness	1/3½	—	1/3	1/4	1/4½	1/4	1/3½	10d. to 1/2	
Kilmarnock	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Kirkcaldy	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Kirkwall	1/7	1/5	1/3	1/4	1/4	1/4	1/4	1/-	
Lanark	1/7	1/7	1/7	1/8	1/7	1/7	1/5½	1/2½	
Leith	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Motherwell	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Perth	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Stirling	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Stirlingshire (Eastern District)	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	
Wishaw	1/7	1/7	1/7	1/8	1/7	1/7	1/6½	1/2½	

* The information given in this table is copyright. The rates of wages in the various towns in England and Wales are given on page 122.

JANUARY 25.—**Newquay.**—HALL, &C.—Erection of a new recreation hall and cloakroom at the Atlantic Hotel, Newquay. Mr. Alfred J. Cornelius, architect, Truro.

JANUARY 25.—**Richmond, Surrey.**—COTTAGES.—Erection of eight cottages in Darell-road and two in Dancer-road, for the B.C. Borough Surveyor, Town Hall, Richmond, Surrey. Deposit 10s. 6d.

JANUARY 26.—**Barnstaple.**—HOUSES.—For the erection of 13 houses on the Newport Housing Site, for the T.C. Borough Surveyor, The Strand, Barnstaple. Deposit £3 3s.

✱JANUARY 26.—**Dorchester.**—DWELLING HOUSES.—Erection of two small farm dwelling houses on Holdings Nos. 1 and 10, Oborne Estate, for the Dorset C.C. County Architect, County Offices, Dorchester.

JANUARY 26.—**Edinburgh.**—HOUSES.—Erection of 18 two-apartment houses at Sheriff Brae, Leith, for the T.C. Messrs. W. N. Thomson & Co., surveyors, 87, Constitution-street, Leith.

JANUARY 26.—**Exminster.**—OPERATING THEATRE.—Erection of an operating theatre at the Devon Mental Hospital. Messrs. E. H. Harbottle & Sons, architects, County Chambers, Exeter. Deposit £3.

JANUARY 26.—**Ilfracombe.**—ALTERATIONS.—For new cells and alterations and additions to Ilfracombe Police Station, for the Devon C.C. Messrs. E. H. Harbottle & Sons, architects, County Chambers, Exeter. Deposit £3.

JANUARY 26.—**Marylebone, W.1.**—SUNDRY REPAIRS, PAINTING, CLEANSING, &C.—Execution of sundry repairs, painting, cleansing and other work at the St. Marylebone Home, 1, Northumberland-street, W.1, for the Board of Guardians of St. Marylebone. Messrs. Constantine & Vernon, architects, 82, Mortimer-street, W.1, between the hours of 10 a.m. and 5 p.m. on January 7, 8, 9, 10, and 11. Deposit £1 (Treasury Note) to architects.

JANUARY 28.—**Blackpool.**—CONVERSION.—For the conversion of the shop premises in West- and Lytham-streets into municipal offices, for the T.C. Mr. Francis Wood, Borough Engineer, Town Hall-street, Blackpool. Deposit £2.

JANUARY 28.—**Carlisle.**—COTTAGES.—Erection of 50 cottages on the Wigton-road Estate, for the T.C. Mr. Henry C. Marks, City Engineer, 18, Fisher-street, Carlisle. Deposit £2 2s.

JANUARY 28.—**Ecuador.**—CUSTOMS HOUSE, &C.—The date for tenders for the construction of the new Custom house and wharf at Guayaquil, Ecuador, has been extended to January 28. Consulate-General 23, College-hill, E.C.4.

JANUARY 28.—**Glasgow.**—QUAY.—For the construction of about 1,928 lineal yards of concrete quay wall forming Dock No. 1 Shieldhall, Glasgow Harbour, for the Trustees of the Clyde Navigation. Mr. T. R. Mackenzie, General Manager, 16, Robertson-street, Glasgow. Deposit £10.

JANUARY 28.—**Guildford.**—HOUSES.—Erection of alternative types of non-parlour houses as follows:—twelve houses on the West Horsley site, six houses on the Peaslake site, in the parish of Shere, six houses on the Pathfield site, in the parish of Shere, for the Guildford Rural District Council. Mr. John Anstee, Council Offices, Commercial road, Guildford. Deposit £2 2s.

JANUARY 28.—**London, S.E.1.**—HOUSES AND ROADS.—Development of a portion of the new Downham housing estate at Grove Park, Lewisham, S.E.: (1) Construction of roads, sewers and other works; (2) the erection of houses and such other buildings as may be determined. Tenders are invited on two alternative bases—(*a*) on the basis of the Council bearing the actual cost of and financing the undertaking and paying a fee or commission to the contractor for his services, the amount of such fee or commission being dependent partly upon a comparison or cost with a predetermined value for the London County Council. Administrator of Housing Development Schemes, Old County Hall, Spring-gardens, S.W.1, upon payment of £10.

JANUARY 28.—**Manchester.**—REPAIRS, &C.—For the execution of general contractor's and plumber's work in connection with the drainage of houses and other premises for 12 months, for the T.C. Mr. J. Irvine, Manager of the Drainage Branch, Public Health Dept., Civic Buildings, 1, Mount-street, Manchester. Deposit £1 1s., for each of three districts.

JANUARY 28.—**Whittingham.**—COTTAGES, &C.—For erection of 15 pairs of parlour cottages near Mental Hospital, and construction of 450 yds. of roads, &c., for Committee of Visitors for County Mental Hospital. Mr. E. J. Andrew, 33, Winckley-square, Preston. Deposit £1 1s.

JANUARY 28.—**Tendring.**—COTTAGES.—Erection of 28 cottages in the parishes of Ardleigh, Lawford and Tendring, for the Tendring R.D.C. Mr. F. G. Vincent-Brown, Cliff-road, Dovercourt Bay. Deposit 10s.

JANUARY 28.—**Thurstonland.**—HOUSES.—Erection of eight dwelling-houses at Town Moor Bottom, for the U.D.C. Messrs. J. Berry & Sons, architects, 3, Market-place, Huddersfield.

JANUARY 28.—**Whitfield.**—ALTERATIONS.—For alterations of shop, for the Whitfield Co-operative Society. Mr. Shield, West Side, Whitfield, Northumberland.

JANUARY 29.—**Consett.**—HOUSES.—Erection of cottages houses, to be in blocks of two, four, six and eight. Tenders for 50, 100 and 150 of such, for the U.D.C. Mr. Frank A. Covle, Architect, 29, Newmarket-street, Consett. Deposit £2 2s.

JANUARY 29.—**Cork.**—VARIOUS WORKS.—(1) Reconstruction of soldiers' quarters, and (2) cookhouse and dining huts at Michael Barracks, for the Commissioners of Public Works. District Office of Public Works, Cork. Deposit £1.

JANUARY 29.—**Dover.**—WALL, &C.—Taking down and rebuilding wall, &c., at Crabble-hill, for the T.C. Borough Engineer, Dover.

JANUARY 29.—**Ebbw Vale (Mon).**—NEW STATION BUILDINGS.—For erecting, for the G.W.R. Co. at Ebbw Vale (Mon), of new station buildings. Office of the Engineer, Newport (Mon), G.W.R. Station.

JANUARY 29.—**Enfield.**—TELEPHONE EXCHANGE.—Erection of a telephone exchange at Enfield, for the Commissioners of His Majesty's Offices of Works. Contracts Branch, H.M.O.W., King Charles-street, London, S.W.1. Deposit £1 1s. (cheques payable to the Secretary).

✱JANUARY 29.—**London, E.**—DWELLINGS.—Erection of a block of dwellings on the Collingwood Estate, Bethnal Green, for the L.C.C. Architect of the Council, The County Hall, Westminster Bridge, S.E.1. Deposit £3, payable to the Cashier.

JANUARY 29.—**Woolwich.**—PROSCENIUM.—For providing new scenery and extension of proscenium. Secretary, Woolwich Arsenal and Town Social Club, Mount Pleasant, Plumstead, S.E.18.

JANUARY 30.—**Brentwood, Essex.**—BALCONY AND VERANDAH.—Erection of a balcony and verandah to an existing building at High Wood Hospital for Children, Ongar-road, Brentwood, Essex, for the Metropolitan Asylums Board. Office of the Board, Victoria Embankment, E.C.4. Deposit £1.

JANUARY 30.—**Leeds.**—SCHOOL.—Erection of Council School at Meanwood, for the T.C. Mr. James Graham, Director of Education, Education Offices, Leeds.

✱JANUARY 30.—**London, S.E.14.**—REPAIRS & PAINTING.—Internal and external repairs and painting at No. 35, New Cross-road, S.E. 14, for the Metropolitan Asylums Board. Office of the Board, Victoria Embankment, E.C.4. Deposit £1.

✱JANUARY 30.—**London, S.W.**—RECONSTRUCTION WORK.—Reconstruction of boiler house and laundry at the South Western Fever Hospital, Landor-road, Stockwell, S.W., for the Metropolitan Asylums Board. Office of the Board, Victoria-embankment, E.C. 4. Deposit £1.

JANUARY 30.—**London, N. 21.**—WOOD BLOCK FLOORING.—Screeding and relaying a floor with new wood blocks at the Northern Fever Hospital, Winchmore Hill, N. 21, for the Metropolitan Asylums Board. Office of the Board, Victoria-embankment, E.C. 4. Deposit £1.

JANUARY 30.—**London, N.W. 5.**—CLEANING AND PAINTING.—Cleaning and painting at St. Margaret's Hospital, Leighton-road, Kentish Town, N.W. 5, for the Metropolitan Asylums Board. Office of the Board, Victoria-embankment, E.C. 4. Deposit £1.

✱JANUARY 30.—**London, W.C. 1.**—ROOFING AND DECORATIVE WORK.—Works, comprising the reconstruction of the roof over the first-class swimming bath, and painting and decorative works at the building known as the first-class swimming bath, Broad-street, W.C., for the Holborn B.C. Mr. E. F. Spurrell, Borough Surveyor, Council Offices, 197, High Holborn, W.C. 1.

✱JANUARY 30.—**Saltash.**—HOUSES.—Erection of 18 houses for working classes (12 of Type A and 6 of Type B) on the New-road Estate. Mr. F. E. Cleverton, Town Clerk, Saltash.

JANUARY 30.—**Walton-on-Thames.**—ASSEMBLY ROOM.—Erection of a Scouts' assembly room at Walton-on-Thames. Secretary, Mr. J. R. Evans, Allington, Arnett-road, Walton.

JANUARY 31.—**Bletchley.**—FILTER HOUSE.—For erection of filter house, &c., for the U.D.C. Mr. J. Chadwick, Civil Engineer, Bletchley, Bucks. Deposit £2 2s.

JANUARY 31.—**Harrow.**—COTTAGE, &C.—For (1) fencing and gates; (2) draining and levelling and providing hard tennis courts; and (3) erecting cottage, pavilions, &c., at West Harrow Recreation Ground, for the U.D.C. Mr. J. P. Bennetts, Surveyor, Council Offices, Harrow. Deposit £1 each contract.

JANUARY 31.—**Hemel Hempstead.**—COTTAGES.—Erection of 24 cottages (in sections of 12), for the Borough of Hemel Hempstead. Mr. Walter R. Locke, Borough Engineer and Surveyor, Market-square, Hemel Hempstead. Deposit £1.

JANUARY 31.—**Lislane, Ireland.**—ALTERATIONS.—For improvements at National School. Rev. J. M'Kee, Balteagh Manse, Limavady.

✱JANUARY 31.—**London, N.W.1.**—ALTERATIONS TO GATEWAY.—Alterations to the gateway of St. Pancras House, 4, King's-road, N.W.1, for the parish of St. Pancras. Clerk to the Guardians, Town Hall, Pancras-road, N.W.1.

JANUARY 31.—**Marske-by-the-Sea.**—HOUSE, &C.—The erection of a farmhouse and set of buildings at Loftus. Mr. Thomas E. Senior, Zetland Estate Office, Marske-by-the-Sea. Deposit £2 2s.

JANUARY 31.—**Newport, Pembroke.**—PAINTING.—For the renovation of the Bethlehem Baptist Chapel. Mr. J. Harris, "Penfeeder," Newport, Pem.

JANUARY 31.—**Paddock.**—HOUSES.—Erection of six dwelling-houses off Heaton-road, Paddock. Mr. Joe Ainley, architect, 3, Chapel-hill, Huddersfield.

JANUARY 31.—**Whitchurch.**—HOUSES.—For erection of six houses in Smallbrook-road, for the U.D.C. Surveyor, Town Hall, Whitchurch, Salop.

FEBRUARY 1.—**Burlingham.**—REPAIRS, &C.—For adapting and repairing the farm buildings at Perowne's Farm, Jary's Estate, Newport Farm and Lodge Farm, Burlingham Estate, for the Norfolk C.C. Small Holdings Committee. Mr. Victor Playle, County Land Agent, Shirehouse, Norwich. Deposit £1 1s.

FEBRUARY 1.—**Swansea.**—SCHOOL.—Erection of a new elementary school for 1,308 scholars on the Town-hill Estate, Swansea, for the Education Committee of the County Borough of Swansea. Mr. Ernest E. Morgan, Borough Architect, 3, Prospect-place, Swansea. Deposit £5 5s.

FEBRUARY 2.—**London, S.E. 18.**—EXTENSION.—Proposed extension of premises, for the Committee of the Woolwich Catholic Club. The Secretary, Woolwich Catholic Club, 28–30, New road, Woolwich. S.E. 18.

FEBRUARY 5.—**Limerick.**—RACE-COURSE STAND, &C.—For erecting (1) reinforced concrete stand, and (2) 50 stables, for the Limerick Race Co. Mr. J. O'Malley, Glentworth-street, Limerick.

FEBRUARY 5.—**Sheffield.**—SUB-STATIONS.—(*a*) Erection of transformer sub-station in Upperthorpe; (*b*) alterations and additions to transformer sub-station n Newhall-road, for the T.C. Mr. S. E. Fedden, General Manager, Commercial-street, Sheffield. Deposit £1 1s. each contract.

FEBRUARY 5.—**Ventnor.**—CONVENIENCES.—For altering existing premises and constructing new conveniences at Marlborough-road, for the U.D.C. Mr. D. V. Howard, Surveyor, Town Hall, Ventnor.

✱FEBRUARY 5.—**Widnes.**—POST OFFICE.—Erection of a new post office at Widnes, for the Commissioners of His Majesty's Office of Works. Contracts Branch, H.M.O.W., King Charles-street, London, S.W.1. Deposit £1 1s. (payable to the Secretary).

FEBRUARY 7.—**Gateshead.**—HOUSES.—Erection of 100 houses of various types and designs on the Carr-hill Building Estate, for the T.C. Borough Engineer, Town Hall, Gateshead. Deposit £5.

FEBRUARY 9.—**Ashford.**—SHEDDING, &C.—For erecting shedding, offices, stands, and other works for the Agricultural Show to be held at Ashford on July 10, 11 and 12, for the Kent County Agricultural Society. Major R. J. Bacon, secretary, Otham, Maidstone.

FEBRUARY 9.—**Dewsbury.**—HOUSES.—Erection of 56 houses, for the T.C. Borough Surveyor, Town Hall, Dewsbury. Deposit £1 1s.

✱FEBRUARY 11.—**Mitcham.**—PUBLIC CONVENIENCES.—Erection of public conveniences on the Upper or Fair Green, Mitcham, for the U.D.C. The Surveyor, Broadway House, Mitcham. Deposit 10s. 6d.

✱FEBRUARY 11.—**Windsor.**—BOILER HOUSE, FIRE-BRICK LINED CHIMNEY, &C.—Construction of boiler house, foundations and setting of Cornish boiler, fire-brick lined chimney, and sundry builders' work in attendance on Engineers, for the Guardians of the Windsor Union. Mr. Walter W. Nobbs, M.I.Mech.E. (the Consulting Engineer in charge of the works), of 50, Fairhazel Gardens, N.W. 6.

FEBRUARY 26.—**London, E.3.**—BUILDING ADDITIONS, &C.—Building of a nurses' dining-room, alterations and additions, and redecorations at St. Andrew's Hospital, Devon's-road, Bow, E.3, for the Managers of the Poplar and Stepney Sick Asylum District, St. Andrew's Hospital. Messrs. Andrews & Peascod, architects, 135, Bow-road, E.3. Deposit £3.

FEBRUARY 28.—**Wakefield.**—WORKSHOPS.—Supply of 17 sectional wood workshops, for the West Riding C.C. Health Committee. West Riding Architect, County Hall, Wakefield.

NO DATE.—**Blofield.**—COTTAGES.—Erection of 16 cottages as follows: Thorpe St. Andrew, 9 cottages; Acle, 4 cottages; and South Walsham, 3 cottages, for the R.D.C. Mr. George J. Skipper, F.R.I.B.A., 7, London-street, Norwich.

NO DATE.—**Brighouse.**—PAINTING.—For painting Brighouse Mills and outbuildings, also canal warehouse. Messrs. Thomas Sugden & Son, Ltd., Brighouse Mills, Brighouse.

NO DATE.—**Burnhope Colliery.**—Tenders are being invited by the Lanchester R.D.C. for the erection of 12 two-story houses at Burnhope Colliery.

NO DATE.—**Carlisle.**—The Corporation are desirous of receiving tenders for the erection of 50 working-class cottages on the Wigton-road Estate, to be built in pairs, of bungalow type, with concrete walls.

NO DATE.—**Erwood.**—COTTAGES.—Erection of a pair of cottages at Erwood, Breconshire, for the Rt. Hon. Lord Glanusk. Mr. J. Vaughan Richards, architect, Crickhowell. Deposit £2 2s.

NO DATE.—**Harrogate.**—LABORATORIES.—For proposed laboratories at Royal Bath Hospital, Harrogate. Messrs. Gibson & Hill, architects, 5, Prospect-crescent, Harrogate.

NO DATE.—**Hebburn.**—The U.D.C. are desirous of receiving tenders for the erection of 11 houses, being part of their scheme for a total of 50.

NO DATE.—**Manchester.**—DEMOLITION.—For the demolition of the four story building at 34-36, King-street, Manchester. Mr. W. Dootson, architect, 83, Heaton Moor road, Stockport.

NO DATE.—**Penicuick.**—HOUSES.—Construction of four houses for the T.C. Mr. James Gray, A.R.I.B.A., 140, Princes-street, Edinburgh.

NO DATE.—**West Allotment.**—Tenders are being invited for the erection of a monument by the West Allotment (Northumberland) War Memorial Committee.

FURNITURE, MATERIALS, etc.

JANUARY 19.—**Manchester.**—GRANITE SETS.—Supply of granite sets to the T.C. Paving, &c., Department, Town Hall, Manchester.

JANUARY 21.—**Chichester.**—MATERIALS.—Supply of tar and road materials to the T.C. Mr. F. J. Lobley, City Engineer, Chichester.

JANUARY 21.—**Darlaston.**—FILTERING MEDIUM.—Supply of 6,400 cu. yds. of cold blast slag or granite filtering medium, delivered on the Sewage Works, for the U.D.C. Messrs. Dodd, Dodd & Watson, County Chambers, Corporation-street, Birmingham. Deposit £1.

JANUARY 21.—**Egypt.**—STORES.—Supply of stores for one year to the Ports and Lights Administration. Dept. of Overseas Trade, 35, Old Queen-street, S.W. Reference 12,046–F.E.–G.P.

JANUARY 21.—**Newton Abbot.**—MATERIALS.—Supply of refined tar, surface dressing, ripping and breaking stones, and gravel and sand, to the Devon C.C. Mr. Andrew Warren, County Surveyor, Avenue-road, Newton Abbot.

JANUARY 21.—**Ramsbottom.**—GRANITE SETTS.—Supply of 1,450 tons of 4 in. by 5 in. granite setts, to the U.D.C. Mr. Thos. H. Bell, surveyor, Ramsbottom.

JANUARY 21.—**Wandsworth.**—MATERIALS.—Supply of materials and execution of works, for the B.C. Mr. D. A. Nicholl, Town Clerk, Council House, Wandsworth, S.W. 18.

JANUARY 21.—**Warrington.**—ASHBINS, &C.—Supply of 500 galvanised steel ashbins and 500 galvanised steel sanitary pails, for the T.C. Cleansing Superintendent, Central Sanitary Depot, Howley, Warrington

JANUARY 21.—**Warrington.**—FIRE HOSE.—Supply of 10 No. 25 yds. lengths of best quality flax canvas 2½ in. dia. fire hose to the T.C. Mr. Andrew M. Ker, Borough Engineer, Warrington.

JANUARY 22.—**Lincoln.**—MATERIALS.—Supply of tarred macadam, broken stone and slag, and hire of steam rollers to the Lindsey C.C. Mr. A. G. Bradshaw, County Surveyor, Newland House, Lincoln.

JANUARY 22.—**Southall-Norwood.**—MATERIALS.—For supply of road and other materials to the U.D.C. Mr. J. B. Thomson, Surveyor, Town Hall, Southall.

JANUARY 22.—**Stratford-on-Avon.**—MATERIALS.—Supply of road materials, &c., to the T.C. Mr. F. W. Jones, Borough Surveyor, Stratford-on-Avon.

JANUARY 22.—**Willesden.**—MATERIALS.—For supply of road and other materials for one year, for the U.D.C. Mr. F. Wilkinson, Town Hall, Dyne-road, Kilburn, N.W.6.

JANUARY 22.—**Worthing.**—REFINED TAR.—For supply of 50,000 galls. of refined tar, for T.C. Borough Surveyor, Municipal Offices, Worthing.

★JANUARY 23.—**Chelsea, S.W.3.**—STORES, &C.—Supply and execution of various articles and works, the contract period being from April 1 next to March 31, 1925, unless otherwise stated, for the Metropolitan Borough of Chelsea. Mr. W. R. Manning, Acting Borough Surveyor. And contracts for stationery, coal, coke, winding and timing clocks, and tailoring from the Town Clerk, Town Hall, King's-road, Chelsea, S.W.3.

JANUARY 23.—**London.**—POLISHES.—Supply to the Commissioners of H.M. Works, &c.: (1) Liquid metal polish; (2) floor polish, &c. Controller of Supplies, H.M. Office of Works, &c., King Charles-street, S.W. 1.

JANUARY 23.—**Madras.**—PIPES.—Supply of stoneware pipes and specials, ranging from 4 in. to 18 in. diameter, and aggregating a total length of 400,000 lineal ft., for the T.C. Messrs. James Mansergh & Sons, agents, 5, Victoria-street, S.W. Charge 5s.

JANUARY 23.—**Southampton.**—MATERIALS.—Supply of road stone and slag to the C.C. Mr. W. J. Taylor, County Surveyor, Winchester.

JANUARY 24.—**Bermondsey.**—MATERIALS.—Supply of stoneware conduits, meters, wiring accessories, engine oils, &c., to the Electricity Department, Borough Electrical Engineer, Town Hall, Bermondsey, S.E.

JANUARY 24.—**Egypt.**—STORES.—Supply of stores for one year to the Dept. of Public Health. Dept. of Overseas Trade, 35, Old Queen-street, S.W. Reference 12,038–F.E.–G.P.

JANUARY 24.—**Fulham.**—WOOD.—Supply of 100 tons of pole ends or wood, suitable for firewood chopping, for the B.G. Mr. E. J. Mott, Clerk, Guardians' Offices, 129, Fulham Palace-road, W.6.

JANUARY 24.—**Wallsend.**—MATERIALS.—Supply of common and facing bricks, lime, scaffold poles, battens, spars, F and G flooring, doors, windows, &c., required in connection with the erection by the Corporation of 36 houses. Borough Surveyor, Town Hall, Wallsend.

JANUARY 24.—**Worthing.**—BRICKS.—For supply of 285,000 2 in. red paving bricks, for the T.C. Borough Surveyor, Municipal Offices, Worthing.

JANUARY 26.—**Chelmsford.**—MATERIALS.—Supply to the Highways Committee of the Essex C.C. stoneware pipes, distilled tar, broken granite, tarred slag, and lubricating oil. Mr. Wm. H. Morgan, County Surveyor, Old Court, Chelmsford.

JANUARY 26.—**Howden.**—MATERIALS.—Supply of granite, whinstone, slag, tarred macadam, refined tar, and tar compounds, to the R.D.C. Mr. Bernard Shaw, Surveyor, Howden, E. Yorks.

JANUARY 26.—**Northallerton.**—MATERIALS.—Supply to the North Riding of Yorkshire C.C. of roadstone, tar and bituminous mixtures, oils and grease, &c. County Surveyor, County Hall, Northallerton.

JANUARY 26.—**Pembroke.**—ROAD MATERIALS, &C.—For supply to the Pembroke R.D.C., for a period of one year from April 1 next, of all the materials requisite for the maintenance of the highways in twenty-eight different parishes. Separate quotation of each parish. Also for supply on hire system of steam rollers and team labour, &c., and steam coal during the same period. Mr. F. S. Jones, Clerk to the Council, Main-street, Pembroke.

JANUARY 26.—**Reigate.**—MATERIALS.—For the supply of road and other materials to the R.D.C. Mr. A. J. Head, 48, High-street, Reigate.

JANUARY 28.—**Camberwell.**—MATERIALS.—Supply of road and other materials, &c. Borough Engineer, Town Hall, Camberwell.

JANUARY 28.—**Sleaford.**—MATERIALS.—Supply of granite and slag, &c., to the R.D.C. Mr. E. H. Godson, clerk, Northgate, Sleaford.

JANUARY 28.—**Uckfield.**—MATERIALS.—Supply of road materials to the R.D.C. Mr. E. W. Ray-Johnson, surveyor, Buxted, Sussex.

JANUARY 29.—**Bermondsey.**—MATERIALS.—Supply of road and other materials for six months to the B.C. Mr. F. Ryall, Town Clerk, Town Hall, Bermondsey, S.E.

JANUARY 30.—**Ashford.**—TAR.—Supply of 20,000 gallons of No. 1 dehydrated coal gas tar, and similar preparations, for tarpainting roads, to the U.D.C. Mr. Wm. Terrill, Surveyor, 5, North-street, Ashford, Kent.

JANUARY 30.—**Islington.**—MATERIALS.—For electrical and engineers' stores, for the B.C. Borough Electrical Engineer, 60, Eden-grove, Islington, N.

JANUARY 31.—**Cheltenham.**—MATERIALS.—For supply of materials to various departments of the T.C. for one year. Mr. J. S. Pickering, Borough Engineer, Municipal Offices, Cheltenham.

★JANUARY 31.—**France and Belgium.**—HEADSTONES.—Supply of 12,000 headstones, packed and delivered F.O.R., to be divided into a number of contracts none of which shall be for less than 100 headstones, for the Imperial War Graves Commission. The Secretary, Works Department, Imperial War Graves Commission, 82, Baker-street, London, W.1.

JANUARY 31.—**Kettering.**—TAR, &C.—For supply of (1) refined tar, (2) ¾-in. chippings, (3) ½-in. Bedford gravel, for one year, for the R.D.C. Mr. H. J. Parker, surveyor, George-street, Kettering.

JANUARY 31.—**Liverpool.**—STORES.—For various stores for the Electricity Dept. of the T.C. City Electrical Engineer, Liverpool.

JANUARY 31.—**Tring.**—MATERIALS.—For supply of blast furnace slag, flints, hoggin and crusted shingles, to the U.D.C. Mr. H. N. Hedges, Surveyor, Tring.

FEBRUARY 1.—**Folkestone.**—MATERIALS.—For the supply of brooms and brushes, cast-iron goods, glass, iron and ironmongery, oils, paint, varnish, &c., Portland cement and timber, to the T.C. Mr. A. E. Nichols, Borough Engineer, Municipal Offices, Folkestone.

FEBRUARY 1.—**Hatfield.**—MATERIALS.—Supply of granite, slag and tar macadam, for the Herts C.C. Mr. A. E. Prescott, County Surveyor, Hatfield.

FEBRUARY 7.—**Wisbech.**—ROAD MATERIALS.—Supply of broken granite, slag and tar macadam to the Isle of Ely C.C. Mr. H. Farr Simpson, County Surveyor, Wisbech.

FEBRUARY 12.—**Tadcaster.**—MATERIALS.—For road material, stores, &c., for the R.D.C. Mr. Geo. A. Bromet, Clerk, Kirkgate, Tadcaster.

FEBRUARY 13.—**Middlesex.**—ROAD MATERIALS.—Supply of granite, tarred slag and granite chippings to the Middlesex C.C. Mr. A. Dryland, County Engineer, Middlesex Guildhall, Westminster, S.W.1.

FEBRUARY 29.—**Canterbury.**—MATERIALS.—Supply of road and other materials to the T.C. Mr. P. H. Warwick, City Surveyor, Canterbury.

FEBRUARY 29.—**Ossett.**—MATERIALS.—For supply of materials, stores, workmen's tools, &c., for one year, for T.C. Borough Surveyor, Town Hall, Ossett.

NO DATE.—**Liverpool.**—TIMBER.—For the supply of about 87,000 cub. ft. of Oregon or pitch pine timber, in lengths varying from 14 to 55 ft., and from 12 in. by 6 in. up to 18 in. by 12 in. in section, to the Harbour Commissioners. Engineer, Harbour Office, Belfast.

ENGINEERING, IRON AND STEEL.

JANUARY 19—**Aberdeen.**—TRAMWAY MATERIAL.—Supply of rails and other tramway material to the T.C. Mr. John Gordon, Burgh Surveyor, Town House, Aberdeen.

JANUARY 19.—**Depwade.**—HEATING, &C.—Supply of steel vertical boiler, horizontal semi-Diesel oil engine, dynamo and motors and accumulators, wiring for power and lighting, supply and fixing apparatus for hot-water heating and domestic hot-water supply, at the Poor Law Institution. Vulcan Boiler & General Insurance Co., Ltd., 67, King-street, Manchester. Deposit £1 1s. each for five sections.

JANUARY 19.—**Edinburgh.**—LATHE.—Supply to car repair works of a heavy pattern tramcar wheel lathe, complete with continuous current motor and equipment, for the T.C. Tramways Manager, 2, St. James'-square, Edinburgh.

JANUARY 19.—**Manchester.**—BOILER.—Supply, at the Ardwick Public Washhouse, of Lancashire boiler, 20 ft. × 8 ft., to work at 100 lb. pressure, for the T.C. City Architect, Town Hall, Manchester. Deposit 10s. 6d.

JANUARY 19.—**Manchester.**—LAUNDRY PLANT.—Supply, at the Ardwick Public Wash-house, of washstalls, hydro extractors, drying horses, with heater, fan, &c., for the T.C. City Architect, Town Hall, Manchester. Deposit 10s. 6d.

JANUARY 21.—**Croydon.**—COOKING APPARATUS.—Supply and installation at Mayday-road Hospital of (*a*) one double-deck drawplate steam pipe oven in brickwork, and (*b*) two separate vegetable steamers or one double steamer, for the Board of Guardians. Steward, Hospital, Mayday-road, Thornton Heath.

JANUARY 21.—**Pontypool.**—LANCASHIRE BOILER.—For provision and installation of a Lancashire boiler, 22 ft. long by 7 ft. diameter, for 120 lb. working pressure, for the Pontypool Board of Guardians. Mr. T. P. H. Watkins, Clerk to the Guardians, Union Offices, Pontypool. Deposit £3 3s.

JANUARY 22.—**Prestwich.**—FENCING.—For supplying and fixing 265 yds. of iron unclimbable fencing, for the U.D.C. Mr. M. A. Piercy, Surveyor, Town Hall, Prestwich.

JANUARY 23.—**Edinburgh.**—PIPES.—Supply of 1,200 tons of dry sand cast-iron pipes, 12 in. in dia., to the T.C. Messrs. J. & A. Leslie & Reid, 29, Waterloo-place, Edinburgh. Deposit £5.

JANUARY 23.—**Hackney.**—LIFT.—For installation of electric passenger lift at Central Institution, Homerton, for Board of Guardians. Mr. F. R. Coles, Clerk, Hackney Union, 2, Sidney-road, E.9.

JANUARY 23.—**Lanchester.**—HEATING.—For the extension of the heating scheme at the Poor Law Institution, for the Board of Guardians. Mr. J. J. S. Barker, Clerk, Lanchester, Durham.

JANUARY 23.—**Poplar.**—BOILING PAN.—Supply to the Institution, High-street, Poplar, E., of a steam jacketed boiling pan, for the Board of Guardians. Mr. H. E. Dennis, Clerk, Offices, Upper North-street, Poplar, E.14.

JANUARY 23.—**Wood Green.**—FENCING.—For supplying and fixing about 1,250 yds. of wrought-iron unclimbable fencing, with gates, &c., for the U.D.C. Mr. C. H. Croxford, Town Hall, Wood Green, N. Deposit £1 1s.

JANUARY 25.—**London.**—PIPES.—For supply of cast-iron pipes to India Store Dept. Branch No. 14, Belvedere-road, S.E.1.

JANUARY 25.—**London.**—SLUICE GATES.—Sluice gates for canal head regulator with 25 ft. gate spans, grooves, operating gear and cross bridge. Branch 12, Belvedere-road, S.E.

JANUARY 25.—**Newcastle-upon-Tyne.**—DERRICKS.—Supply to the Tyne Improvement Commission of three 2½ tons lattice steel derricks, fitted with electric winches. Mr. Albert Blacklock, Secretary, Bewick-street, Newcastle-upon-Tyne. Deposit £22s.

★JANUARY 28.—**London.**—IRON FENCING.—Supply and erection of wrought iron unclimbable fencing at parks under the control of the L.C.C. Chief Officer, Parks Department, The County Hall, Westminster Bridge, S.E. 1.

JANUARY 28.—**Manchester.**—GRIDS, &C.—Supply of ventilating grids and other castings, for 12 months. Mr. J. Irvine, Manager of the Drainage Branch, Public Health Dept., Civic Buildings, 1, Mount street, Manchester.

JANUARY 29.—**London.**—GIRDERS.—Supply to Director-General, India Store Department, of girders. Branch 15, Belvedere-road, S.E.

JANUARY 30.—**Girvan.**—PIPES.—Supply of 520 tons of cast-iron pipes and special castings of 8 ins., 7 ins., and 3 ins. dia., to the T.C. Messrs. Warren & Stuart, 94, Hope-street, Glasgow. Deposit £2 2s.

JANUARY 30.—**London and Carshalton.**—BOILER WORK, &C.—(*a*) Installation of a two-roller ironing machine at Goldie Leigh Homes, Abbey Wood; (*b*) conversion of two steam boilers from mechanical stoking to hand firing at Queen Mary's Hospital for Children, Carshalton, for the Metropolitan Asylums' Board. Office of the Board, Victoria Embankment, E.C. 4. Deposit £1 each contract.

JANUARY 30.—**London.**—VARIOUS WORKS.—(a) installation of a 144-tube economiser, (*b*) installation of a new continuous drying machine, (*c*) engineering work for new central boiler house, (*d*) revising the laundry engineering arrangements, (*e*) installing electric light and power wiring in boiler house and laundry, (*f*) covering of boilers, steam feed and suction, mains, &c., with non-conducting composition, at the South-Western Fever Hospital, Landor-road, Stockwell, S.W.9, for the Metropolitan Asylums Board. Offices of the Board, Victoria Embankment, E.C.4. Deposit £1 each contract.

JANUARY 30.—**Wembley.**—BRIDGE WIDENING.—For widening of the L. & N.E. Railway bridge in Wembley Hill-road. Mr. W. H. Lewis, Acting Surveyor, Council Offices, Wembley, Middlesex. Deposit £2 2s.

JANUARY 31.—**Alnwick.**—WEIGHBRIDGE.—For installing a weighbridge to weigh up to 3 tons, for the U.D.C. Mr. J. Temple Robson, Surveyor, Council Offices, Alnwick.

JANUARY 31.—**Poole.**—TRAINING BANK.—For construction of a training bank on South Haven side of entrance to Poole Harbour, for Poole Harbour Commissioners. Mr. H. Kendall, Surveyor, Poole, Dorset. Deposit £3 3s.

JANUARY 31.—**Skegness.**—HEATING.—For heating Council offices by low-pressure hot-water system, for the U.D.C. Mr. R. H. Jenkins, Surveyor, Council Offices, Skegness. Deposit £1 1s.

FEBRUARY 2.—**Harrow.**—ROLLER.—Supply of 8-ton or 10-ton compound steamroller with scarifier, to the U.D.C. Mr. J. P. Bennetts, Surveyor, Council Offices, Harrow.

FEBRUARY 4.—**Dublin.**—STEELWORK.—Supply to the Midland Great Western Railway of Ireland of steelwork for canal footbridge, Maynooth. Chief Engineer, Broadstone Terminus, Dublin. Charge 4s.

FEBRUARY 4.—**Manchester.**—CRANE.—For one locomotive jib crane and grab. Mr. S. L. Pearce, Electrical Engineer, Dickinson-street, Manchester. Deposit £1 1s.

FEBRUARY 4.—**Salford.**—COOKING EQUIPMENT.—For a complete cooking and kitchen equipment at Ladywell Sanatorium, for the T.C. Medical Officer of Health, 143, Regent-road, Salford.

FEBRUARY 5.—**Egypt.**—PUMPING PLANT.—For supply and erection of a pumping plant to replace an existing steam plant at Qussassin. Inspecting Engineer, Egyptian and Sudan Governments, Queen Anne's Chambers, S.W.1. Charge 10s.

FEBRUARY 5.—**New Zealand.**—GIRDER SPANS.—Supply of plate girder spans to the Public Works Tender Board, New Zealand, for the Stratford Main Trunk Railway. Department of Overseas Trade, 35, Old Queen-street, S.W. Reference 12569/ED/EC.

FEBRUARY 5.—**Richmond (Surrey).**—PIPES.—Supply of 80 tons of 9 in. and 7 in. dia. cast-iron pipes and special castings to the T.C. Mr. H. Will. Apted, Water Engineer, Waterworks, Richmond.

FEBRUARY 11.—**Gainsborough.**—PUMPING PLANT.—For engine and pumping plant, for the U.D.C. Mr. S. W. Parker, Waterworks Engineer, Council Offices, Gainsborough. Deposit £2 2s.

★FEBRUARY 11.—**Windsor.**—RECONSTRUCTION OF ENGINEERING SERVICES.—Reconstruction of the engineering services at the Poor Law Institution, Old Windsor, Berks, for the Guardians of the Windsor Union. Constructors must tender for the whole of the work. Mr. Walter W. Nobbs, M.I.Mech.E. (the Consulting Engineer in charge of the works), of 50, Fairhazel Gardens, N.W. 6. Deposit £5 5s.

FEBRUARY 14.—**Argentine.**—POWER STATION.—For the construction of a central electric power station of 15,000 h.p., for the Argentine State Oilfields Administration. Department of Overseas Trade, 35, Old Queen-street, S.W.

FEBRUARY 18.—**Bristol.**—ELEVATOR.—For the construction of a floating pneumatic grain elevator, to handle 150 tons per hour, at the Avonmouth Docks, for the Docks Committee. Mr. T. A. Peace, Engineer, Port of Bristol. Deposit £5.

FEBRUARY 27.—**Madras.**—PIPES.—Supply of cast-iron pipes, special castings, &c., to the T.C. Messrs. J. Mansergh & Sons, agents to the Corporation, 5, Victoria-street, S.W.

MARCH 1.—**Jamaica.**—DAM.—For the construction of a cyclopean masonry dam and contingent works required in connection with the extension of the Kingston and St. Andrews Water Works. Crown Agents for the Colonies, 4, Millbank, London, S.W.1.

MARCH 8.—**South Africa.**—POWER STATION.—For steel frame buildings for power station and equipment of power station, &c., for electrification of railways in the neighbourhood of Cape Town, for the Union of South Africa Electricity Supply Commission. Messrs. Merz & McLellan, 32, Victoria-street, S.W. Deposit £10 10s.

MAY 1.—China.—BRIDGE.—The Commercial Councillor at Peking has forwarded to the Department of Overseas Trade copies of the official text of a call for tenders by the Hai Ho Conservancy Commission, for the erection of a bridge over the Hai Ho at Tientsin. Tenders must be in the hands of the Commission before noon on May 1, 1924. The cost of erecting the new bridge has been roughly estimated at Tls. 700,000, say £105,000. Department of Overseas Trade, 35, Old Queen-street, S.W.1. Reference 11647/F.E./E.C./2.

NO DATE.—**Bargoed.**—DRIVAGE.—For driving two drifts, each approximately 220 yds. long. Manager, Gilfach Colliery, Bargoed.

ROAD, SANITARY, AND WATER WORKS.

JANUARY 19.—**Edinburgh.**—PAVING.—For laying smooth bitumastic paving along tramway track in Seafield-road, for T.C. Tramways Manager, 2, St. James'-square, Edinburgh.

JANUARY 19.—**Falmouth.**—SEWERAGE WORKS.—For laying 4,340 ft. of 21 in. concrete tubes, &c., construction of storage tank, &c., and cast-iron sea outfall, for the T.C. Mr. G. Midgley Taylor, 36, Victoria-street, S.W. Deposit £5 5s.

JANUARY 19.—**Manchester.**—SEWERS.—Construction of main drainage work, for the T.C. City Engineer Town Hall, Manchester. Deposit £10 10s.

JANUARY 21.—**Aberystwyth.**—EXCAVATION, &C.—For excavations, drainage and clay puddling at No. 1 service reservoir, Llangamsa, for the Aberystwyth T.C Mr. W. D. Puddicombe, F.S.I., Borough Surveyor Aberystwyth.

JANUARY 21.—**Anglesey.**—ROAD.—Reconstruction of approximately 12 miles of the main road from Amlwch to Llangefni, for the C.C. Mr. W. E. Jones, County Surveyor, Graig, Llanfair P.G., Anglesey. Deposit £3 3s.

JANUARY 21.—**Blackpool.**—ROADS, &C.—For surface draining and forming of private streets, for the T.C. Mr. Francis Wood, Borough Engineer, Town Hall-street, Blackpool. Deposit £1.

JANUARY 21.—**Gleneagles.**—ROADS.—Construction of new roads at Gleneagles, for the London, Midland and Scottish Railway Company. Divisional Engineer, Buchanan-street Station, Glasgow. Deposit £2 2s.

JANUARY 21.—**Heywood.**—WATER MAINS.—Laying of 5 miles of 4 in. to 12 in. cast-iron water mains in Heywood, Middleton, and Chadderton, for the Water Board. Messrs. James Diggle & Son, civil engineers, 14, Brown-street, Manchester. Deposit £3 3s.

JANUARY 21.—**Islington.**—ROADS.—For surfacing 50 miles of roads with tar or bituminous material, for the B.C. Municipal Offices, Tyndale-place, N.1.

JANUARY 21.—**Rhostyllen.**—BOWLING GREEN.—For a bowling green 40 yds. sq. with a 9 in. crown. Mr. W. Herbert Jones, Clerk, Rhostyllen.

JANUARY 21.—**Southport.**—TRAMWAY TRACK, &C.—Construction of tramway routes of about 1,600 yards; also the reconstruction with concrete and bituminous asphalte of the carriageways, &c., for the T.C. Mr. A. E. Jackson, Borough Engineer, Town Hall, Southport. Deposit £3 3s.

JANUARY 21.—**Taunton.**—SEWAGE WORKS.—For reconstruction of sewage disposal works, for the T.C. Mr. I. F. Shellard, Borough Engineer, Taunton. Deposit £3 3s.

JANUARY 22.—**Blackpool.**—ROADS.—Construction of cantilever extension to Queen's Drive, North Shore, for the T.C. Mr. F. Wood, Borough Engineer, Municipal Buildings, Blackpool.

JANUARY 22.—**Bridgend.**—CULVERT.—For rebuilding in cement concrete Bridgend culvert (7¼ miles from Ashperton station), for the Hereford C.C. Mr. G. H. Jack, County Surveyor, High Town, Hereford.

JANUARY 22.—**Coulsdon.**—ROADS.—For making up Purley Oaks-road, for the U.D.C. Mr. R. Chart, Surveyor, Council Offices, Purley. Deposit £2 2s.

JANUARY 22.—**Coulsdon.**—SEWER.—Construction of 550 lin. yds. of 9 in. sewer and manholes, for the U.D.C. Mr. R. Chart, Surveyor, Council Offices, Purley. Deposit £2 2s.

JANUARY 22.—**Enfield.**—SEWERAGE WORKS.—For construction of 148 yds. of granite concrete tube sewer, in Church-street, for U.D.C. Mr. H. R. Crabb, Surveyor, Public Offices, Enfield. Deposit £2 2s.

JANUARY 22.—**London, E.**—PAVING, &C.—For taking up and relaying certain wood-block paving and incidental work in connection therewith to a portion of roadway at the Hospital, Bancroft-road, for the Guardians of the Poor of the Hamlet of Mile End Old Town. Mr. Edmund J. Harrison, Lic.R.I.B.A., 23, Berkeley-road, Crouch End, N.8. Deposit £2.

JANUARY 23.—**Aldeburgh.**—WATER MAINS.—Supplying and laying 517 lin. yds. 6 in. and 516 yds. 4 in. cast-iron water mains, for the T.C. Mr. John Cooper Gordon, Borough Surveyor, Aldeburgh.

JANUARY 23.—**Barnet.**—ROADS.—For supply of artificial stone paving and repaving Sydney and Cromwell-roads footways, for the U.D.C. Mr. F. P. Kindell, Surveyor, Council Offices, The Priory, Friern Barnet-road, New Southgate, N.

JANUARY 23.—**Birmingham.**—SEWERS. — Construction of about 670 yds. of brick and concrete sewers, and 2,250 yds. of stoneware pipe sewers, &c., on the Batchelor's Farm Housing Estate, Bordesley Green, for the T.C. Mr. H. H. Humphries, City Engineer, Council House, Birmingham. Deposit £2.

JANUARY 23.—**Chipping Norton.**—WATER WORKS.—For providing and laying about 541 lineal yds. of 2 in. cast-iron water main and specials, for the T.C. Mr. R. Stanton, Borough Surveyor, Chipping Norton.

JANUARY 23.—**Edinburgh.**—SANITARY.—Supply and install additional sanitary appointments at Gogarburn House, for the Edinburgh District Board of Control. Mr. James D. Gibson, Surveyor, 60, Frederick-street, Edinburgh.

JANUARY 23.—**Stockton-on-Tees.**—ROADS.—For the completion of Greta-road, from Lune-road to Norton-avenue, for the T.C. Borough Engineer, Victoria buildings, Stockton.

JANUARY 23.—**Truro.**—WATER SCHEME.—Construction of cast-iron water mains, brickwork tanks, the repair of a water wheel, the supply and erection of a pump, &c., in connection with the water supply of St. Agnes, for the R.D.C. Mr. Coulter Hancock, Clerk, 12, Princes-street, Truro.

JANUARY 23.—**Wood Green.**—ROADS.—For works of private street improvements in King's-mews, for the U.D.C. Surveyor, Town Hall, Wood Green, N.22. Deposit £1 1s.

JANUARY 24.—**Dungannon.**—WATER AND SEWERAGE.—For construction of works for supplying Coolisland with water and for a complete scheme of sewerage, for the R.D.C. Mr. J. H. H. Swiney, engineer, Avenue Chambers, Belfast. Charge £1 1s.

JANUARY 24.—**Ely.**—SERVICE CONNECTIONS.—For approximately 1,000 house service connections, from the main to the property line as follows: (7) excavating and refilling trenches for service pipes; 8) providing and laying lead and galvanised iron service pipes, for the R.D.C. Mr. F. W. Green, Clerk, Council Offices, 11, Lynn-road, Ely, Cambs.

JANUARY 24.—**Holborn.**—ROADS.—For supplying and laying (*a*) 2 in. compressed rock asphalte; (*b*) 2 in. bituminous jointless material; and (*c*) 2 in. compressed rock asphalte on bituminous jointless material paving, for the B.C. Mr. E. F. Spurrell, Borough Surveyor, Council Offices, 197, High Holborn, W.C.

JANUARY 24.—**Lambeth.**—ROADS.—Supplying and laying of two-coat bituminous paving in Brook-street (part) and Priory-road, for the B.C. Mr. O. Cattlin, Lambeth Town Hall, Brixton-hill, S.W. 2.

JANUARY 26.—**London.**—DRAINAGE, &C.—For drainage work and earthwork bridges in connection with construction of new arterial roads, viz.: Orpington by-pass, Bexley Heath by-pass, West Wickham and Farnborough by-passes, for Ministry of Transport. Chief Engineer, Arterial Roads' Department, Ministry of Transport, 7, Whitehall-gardens, S.W. 1. Deposit £225.

JANUARY 26.—**Morley.**—ROADS.—For the surfacing of verges with red shale, planting of privets, and other incidental work on Victoria-road housing site, for the T.C. Mr. F. Turner, Borough Engineer, Town Hall, Morley.

JANUARY 28.—**Alnwick.**—WATER MAINS.—For providing and laying 3,675 yds. of 4 in. cast-iron socket pipes along the road from Hawkhill to Alnmouth, for the R.D.C. Clerk, 24, Fonkle-street, Alnwick.

JANUARY 28.—**Amsterdam.**—PAVING.—For carrying out of about 150,000 super meters of asphaltic or other noiseless paving on foundation. Chief Engineer of Public Works, Paving Department, Town Hall, Amsterdam. Deposit £2 2s.

JANUARY 28.—**Kirkintilloch.**—WATER WORKS.—For forming roads, &c., and laying pipes in connection with the installation of a pumping plant at Antermony Loch, for the T.C. Messrs. W. R. Copland & Sons, Civil Engineers, 146, West Regent-street, Glasgow. Deposit £2 2s.

JANUARY 28.—**London, S.E.1.**—ROADS.—Completion of the carriageways and footways of certain roads on the Rochampton Housing Estate, Putney, in the Metropolitan Borough of Wandsworth, comprising surfacing carriageways with tarred slag macadam, paving footways with artificial stone and other work. Administrator of Housing Development Schemes, Old County Hall, Spring-gardens, S.W.1. Deposit £2.

JANUARY 28.—**Loughborough.**—SEWER.—For construction of sanitary pipe sewers in Forest-road, for the R.D.C. Messrs. A. E. King & Co., architects, 19, Baxter Gate, Loughborough. Deposit £3 3s.

JANUARY 28.—**Sheffield.**—SEWER.—Construction of 970 yds. of brick and concrete storm sewer in the Upperthorpe District, for the T.C. Mr. W. J. Hadfield, City Surveyor, Town Hall, Sheffield. Deposit £2 2s.

JANUARY 28.—**Weardale.**—ROADS.—For road diversion on Wolsingham to Tow Law-road, including construction of reinforced culvert, for the R.D.C. Mr. G. W. Egglestone, Stanhope, Co. Durham.

JANUARY 29.—**Consett.**—ROADS, &C.—For 300 yards lin., and sewers, and 230 yards lin., with tarpaving and other general works, for the U.D.C. Mr. Frank A. Coyle, Architect, 29, Newmarket-street, Consett. Deposit £2 2s.

JANUARY 29.—**London.**—SEWER.—Construction of an 8 ft. internal diameter sewer in brick and iron of a total length of about 2¼ miles, Woolwich and Greenwich, for the L.C.C. Chief Engineer, Old County Hall, Spring-gardens, S.W.1. Deposit £10.

JANUARY 29.—**Rogerstone.** — EARTHWORKS. — For earthwork at Rogerstone, near Newport, Mon, for the G.W.R. Co. Engineer, High-street Station, Newport.

JANUARY 30.—**Girvan.**—WATERWORKS.—Supplying and laying six miles of cast-iron pipes, together with the construction of two break pressure tanks, &c., for the T.C. Messrs. Warren & Stuart, 94, Hope-street, Glasgow. Deposit £2 2s.

JANUARY 30.—**Hemel Hempstead.**—ROADS, &C.—Construction of a tarmacadam surfaced road about 175 yards in length, for the T.C. Mr. W. R. Locke. Borough Engineer, Hemel Hempstead. Deposit £1 1s.

JANUARY 30.—**Wembley.**—ROADS.—Execution of road works in Wembley Hill-road contingent upon the widening of the bridge over the L. & N.E. Railway (Great Central Service), for the U.D.C. Mr. Walter H. Lewis, Surveyor, Council Offices, Wembley. Deposit £2 2s.

JANUARY 31.—**Bilston.**—SEWAGE DISPOSAL WORKS.—Construction of storm-water tanks, screening bay, detritus tanks, diversion of outfall sewer, cast-iron and stoneware pipes, &c., for the U.D.C. Messrs. Dodd, Dodd & Watson, County Chambers, Corporation-street, Birmingham. Deposit £5.

FEBRUARY 1.—**Wallington.** — TARSPRAYING. — For work of tarspraying roads within the district for the year, for U.D.C. Mr. S. F. R. Carter, Surveyor, Council Offices, Wallington.

FEBRUARY 2.—**Hythe.**—ROADS, &C.—Construction of roads and laying of sewers and water mains in various parts of the Borough, for the T.C. Mr. Walter F. Bickford, Borough Surveyor, 114, High-street, Hythe. Deposit £3 3s.

FEBRUARY 5.—**Cheriton.**—ROADS.—For private street improvement works in Marler-road and Kent-road, for the U.D.C. Mr. A. S. Lilley, Surveyor, Public Offices, Cheriton.

FEBRUARY 5.—**Sedbergh.**—WATER SUPPLY.—For laying about 2,200 lin. yds. of 5 in., 4 in., and 3 in. cast-iron pipes, construction on an intake tank, mechanical filters, concrete service tank (95,000 galls.), &c., for the R.D.C. Messrs. Taylor & Wallin, Commercial Union Buildings, 47, Pilgrim-street, Newcastle-on-Tyne. Deposit £5.

FEBRUARY 6.—**Birmingham.**—SEWAGE DISPOSAL.—For the reconstruction of the sewage disposal plant and drains at Wassell-grove Convalescent Home, near Stourbridge, for the Board of Guardians. Mr. James Curtis, Clerk, Union Offices, Edmund-street, Birmingham. Deposit £1 1s.

FEBRUARY 6.—**Watford.**—ROADS.—For construction of new estate roads and sewers, &c., at Wiggenhall, for T.C. Mr. D. Waterhouse, Borough Engineer, Municipal Offices, 14, High-street, Watford. Deposit £2 2s.

FEBRUARY 7.—**Swansea.**—SEWERS.—For construction of stoneware and cast-iron sewers at Llansamlet, totalling 9,943 lineal yds. for the T.C. Mr. J. R. Heath, Engineer, Main Drainage Dept., Guildhall, Swansea. Deposit £5 5s.

FEBRUARY 9.—**Lancashire.**—ROADS.—Construction of a new road and the widening and reconstruction of part of the existing main road between the "Rose and Crown Inn," Much Hoole, and Sollom, for the Lancashire C.C. County Surveyor, County Offices, Preston.

FEBRUARY 16.—**Greenock.**—ROADS, &C.—Construction of streets and sewers in connection with the Cowdenknowes housing scheme, for the T.C. Office of Public Works, Municipal Buildings, Greenock. Deposit £1 1s.

✱MARCH 1.—**Montgomeryshire.**—STORAGE RESERVOIR AND WATER MAINS.—Construction of a small storage reservoir, and the laying of a main in connection with an additional water supply, for the T.C. of Llanidloes. Mr. James Grant, Surveyor, Llanidloes, Montgomeryshire.

Competitions.

(*See Competition News, page* 100).

Auction Sales, Tenders, etc.

JANUARY 22.—**London, W.**—Messrs. J. T. Skelding & Co. will sell, by order of Messrs. Selfridge & Co., Ltd., at the Yard, Balderton-street, Oxford-street, W., important unreserved sale of the capital surplus of builders' and contractors' plant and machinery, timber, stores and effects. Auctioneers, 48, Gresham-street, E.C.2.

JANUARY 22 AND 23.—**Banbury.**—Mr. F. H. Clark will sell, without reserve, timbers and building materials contained in the Banbury Filling Factory, Banbury, Oxon, at 11 a.m. each day. Auctioneer, Railway Wharf, York-road, Wandsworth.

JANUARY 23.—**London, W.1.**—Messrs. Henry Butcher & Co. have received instructions to sell at the Auction Rooms, 556, Oxford-street, W.1, large quantities of miscellaneous tools and stores, &c. Auctioneers, 63 and 64, Chancery-lane, London, W.C.2.

JANUARY 23.—**St. Albans, Herts.**—Messrs. Harding & Son will sell, by direction of the Right Hon. the Earl of Verulam and Viscount Grimston, at the "Peahen" Hotel, St. Albans, in lots, about 112 acres of exceptionally valuable freehold building land, all on gravel soil, with over two miles of frontage to good main roads. Auctioneers, 36, St. Peter's-street, St. Albans.

✱JANUARY 23.—**Sutton, Surrey.**—Mr. C. E. Clark will sell without reserve, opposite the Green, High-street, Sutton, Surrey, timber and builders' effects, including 300 squares, prime weather boards, &c. Auctioneers, Beddington, near Croydon.

JANUARY 24.—**County Down.**—Messrs. Garnet W. Holt & Co. will sell, by public auction, the Crowreach Quarries, Newry, with yard, machinery, plant, &c., on the premises at Catherine-street, Newry, to be sold in two lots. Auctioneers, Newry.

FEBRUARY 7.—**London, W.1.**—Messrs. Knight, Frank & Rutley, in conjunction with Messrs. Oakden & Co., will sell, by direction of the Eastbourne Waterworks Company, the freehold commercial site of about 4½ acres, including detached double-fronted residence, factory and warehouse buildings. Auctioneers, 20, Hanover-square, London, W.1.

✱MAY 6.—**London, W.1.**—Messrs. Knight, Frank & Rutley, at the Hanover-square Estate Room, situate at Wimbledon Common, within half-an-hour by motor of the Houses of Parliament Freehold, Edgecombe Hall, Beaumont-road; extensive range of outbuildings, in all extending to over 14 acres. Vacant possession will be given on completion of the purchase. Auctioneers, 20, Hanover-square, W.1.

Public Appointments.

JANUARY 19.—**Southend-on-Sea.**—Clerk of Works required by the County Borough of Southend-on-Sea, age not to exceed 45 years; applicants must be experienced. Mr. Robert H. Dyer, Borough Engineer, Municipal Buildings, Clarence-road, Southend-on-Sea.

JANUARY 21.—**Southend-on-Sea.**—Building Inspector required in the Borough Engineer and Surveyor's Department, by the County Borough of Southend-on-Sea; candidates must be experienced in similar work. Mr. Robert H. Dyer, Borough Engineer, Municipal Buildings, Clarence-road, Southend-on-Sea.

✱JANUARY 22. — **Merthyr Tydfil.**—The B.C. is to appoint two temporary Architectural Assistants for approximately six months' service. One assistant must be experienced in preparation of contract drawings, bills of quantities, &c., for housing schemes; and the other experienced in outdoor surveying, levelling, and preparation contract drawings for housing schemes. Applications to be made to Mr. T. A. Aneuryn Rees, Town Clerk, Town Hall, Merthyr Tydfil, and should detail experience, age, qualifications and be accompanied by two testimonials.

✱JANUARY 23. — **Manchester.** — Draughtsman required by the Joint Committee of the Manchester and District Joint Town-Planning Advisory Committee. Mr. P. M. Heath, Hon. Secretary, Town Hall, Manchester.

✱JANUARY 23.—**Southport.**—Temporary Architectural Assistant required in the Borough Engineer's Department by the County Borough of Southport. Mr. A. E. Jackson, M.Inst.C.E., Borough Engineer, Town Hall, Southport, endorsed "Temporary Architectural Assistant."

✱JANUARY 24.—**Edgware.**—Quantity Surveyor required in connection with the proposed Redhill Hospital, Edgware, for about 175 beds, for the Guardians of the Hendon Union. Mr. F. J. Seabrook, Clerk to the Guardians, Union Offices, Edgware.

✱JANUARY 28.—**Stoke-on-Trent.**—Competent temporary Assistant Quantity Surveyor required by the County Borough of Stoke-on-Trent. Mr. A. Burton, M.Inst.C.E., F.S.I., Borough Surveyor, Town Hall, Stoke-on-Trent, together with copies of three testimonials.

✱FEBRUARY 1. — **Swansea.** — Architectural Draughtsman required in the Borough Architect's Department by the County Borough of Swansea. Borough Architect, Guildhall, Swansea, endorsed "Draughtsman."

PROPOSED NEW BUILDINGS & OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works at the time of publication have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C for Rural District Council; E.C. for Education Committee; B.G. for Board of Guardians; L.C.C. for London County Council; B C for Borough Council; and P.C. for Parish Council.

ABERDEEN.—Plans passed by T.C.: Six houses, Braemar-place, for the Broomhill Home Building Syndicate, per Messrs. M'Andrew & Sutherland, architects; additions to warehouse, Palmerston-road, for William Davidson, Ltd., per Messrs. Sutherland & George, architects; loading shed, Palmerston- road, for the Caledonian Milling Company, Ltd., per Messrs. Wilson & Walker, architects; house, Spri gfield-road. for Mr. Alexander Duff, steward, per Mr. William E. Gauld, architect.——The Corporation propose to erect 48 houses at Cattofield, tenders for which are to be invited at once.

ALNWICK.—With a view to encouraging private enterprise in building, the U.D.C. have intimated their intention to subsidise intending builders to the extent of £100 per house, subject to permission being secured from the M.H.

ARNOLD.—The Rev. Nenson, of the Church of the Good Shepherd, has secured a site for a new church, but has not yet appointed an architect to prepare plans.

ASHTON-IN-MAKERFIELD.—The following plan was approved: Two houses in Soughers-lane, for Mr. J. Gorner.

AUCKLAND.—The M.H. has sanctioned a loan of £19,302 for the erection of a housing scheme at Conndo.

AUDENSHAW.—Sanction has been given by the M.H. to the borrowing by the Council of £3,310 for the reconstruction of Droylesden-road.

AYLESBURY.—Plans passed by T.C.: Two houses, New-street, Messrs. Fleet & Roberts, for Mr. Geo. Allen, Bierton Hill.

BARNES.—Plans passed by U.D.C.: Two houses, Gerard road, by Messrs. Bell & Kay; 10 houses, Kingsway, east of Clifford-avenue, by Messrs. Evans & Sons; house, Christ Church-road, by Mr. W. Burridge; two houses, Shalstone-road, by Mr. R. B. Rowell; Parish Hall, Rectory Grounds, Barnes, by Mr. R. B. Rowell; five houses, Kingsway, by Mr. W. H. Pecover; house, Derby-road, by Mr. G. McCarthy.

BARNSLEY.—Plans passed by T.C.: W. & J. Wainwright, two houses, Burton-road, Monk Bretton; Barnsley Brewery Co., off-licence shop and house, Rowland-road; C. Holroyde & C. B. Chadwick, two houses, Keresforth Hall-road; J. E. Holroyde & G. W. Blenkinsop, two houses, Keresforth Hall-road; A. E. Wood, two houses, Allendale-road; Miss C. Simmons, two houses, Locke-avenue; A. Ibbotson, two houses, Woodstock-road; F. W. Rogers, house, Woodstock-road; G. Ambler, bungalow, Pontefract-road; L. Barraclough, two houses, Locke-avenue; T. Dyson, house, Woodstock-road; F. Birkinshaw, three houses, Cavendish-road; Mrs. J. Beadman, house, Barnsley-road, Stairfoot; W. Avill, two houses, Locke-avenue; E. Ashton, two houses, Locke-avenue; Alan Pye, four houses, Spencer-street; T. Goulding, two houses, Wombwell-lane; Mrs. W. Squires, extension to workshop, Britannia-street; W. H. Lister, house, Cawthrow-avenue, Monk Bretton; G. & C. Bland, two houses, Wentworth-street, Honeywell Mount; Alfred Murton, house, Welbeck-street; F. Gelder, house, Field-lane, Stairfoot; A. J. Jacobs, house, Lamb-lane, Monk Bretton; W. R. White, house, Woodstock-road; W. Hill, house, Burton-road, Monk Bretton; F. Wilson, house, Woodstock-road.

BELFAST.—Plans passed: Two villas, Ormiston-parade, for Mr. Charles Dickey (architect, Mr. W. J. Walshe); five houses, Newtownards-road Upper, for Mr. Joseph Robinson (architect, Mr. Hugh Gault); stores, Edinburgh-street, for Mr. James Wylie (architect, Mr. J. C. Stevenson); additions to Ulster Club, Castle-place, for the trustees of the Club (architect, Mr. Godfrey W. Ferguson); six villas, Old Cavehill-road, for Mr. Alexander Jones; reconstruction of shop and showroom, Cromac-street, for the representatives of the late Felix O'Hagan (architect, Mr. W. J. Gilliland); workshops and stores, Charlotte-street, for Messrs. Wm. Coates & Sons (architect, Mr. R. I. Calwell); stables and stores, Frank-street Upper, for Mr. James McCullough (architect, Mr. R. Lynn); shop and stores, Antrim-road, for Messrs. E. & W. Pim (architect, Mr. John Seeds); three shops, East Bridge-street, for the Ulster Banking Co. (architect, Mr. T. W. Henry); four villas, Luxor-gardens, for Mr. John Buckley; workshop and offices, Wandsworth-gardens, for the East Belfast Housing Society; seven houses, Ardilea-street, for the White Cross Building Society (architects, Messrs. F. & J. McArdle); two villas, Skegoniel-avenue, for Messrs. S. M. Thompson & Charles McCallion (architect, Mr. J. St. John Phillips); football pavilion, near Fairfield-street, for the Highfield F.C.; two houses, Oldpark-road, for A. E. Fair; shops and stores, Lisburn-road, for B. Stafford; house, Sandown-road, for Mrs. V. Neill; alterations to shop and house, Woodstock-road, for J. Crawford; shed and engine-house, Sydenham-road, for H. Bodel; two houses, North-road, for G. Mercer; house, Finvoy-street, for the East Belfast Housing Society, Ltd.; stores, Divis-street, for Wordie & Co.; six houses, Sandown road, for W. Evans; house, Balmoral-avenue, for A. W. Stewart; house, &c., New Forge-lane, Malone-road, for T. B. Johnston; houses, Somerton-road, for A. Taggart; four houses, College Park, Belmont, for R. O. Templeton; house, Castlehill-road, for A. W. McMillan; house, Chlorine-gardens, for W. D. R. Taggart; store, Holmes-street, for D. W. Corry; two houses, Lansdowne-road, for T. McKee & Sons; shop and house, Crumlin-road, for Miss H. M. McConnell; house, Myrtlefield-park, for A. McDowell; store, High-street, for J. Currie & Co.; additions to four houses, Dunowen-gardens, for J. Carson & Son; additions to eight houses, Dunowen-gardens, for J. Carson & Sons; vestry to Cathedral, Donegall-street, for the Select Vestry of St. Anne's Cathedral; house, "Beechlands," Malone, for C. P. Chapman; five houses and shop and house, Beechmount-avenue, for the Belfast Building Guild, Ltd.; two houses, Kincora-avenue, for T. Glover; eighteen houses, Kerrsland-drive, Kerrsland-crescent and Kerrsland-parade, for R. Hewitt; seven lock-up shops, Peter's-hill, for Frederick McKibben; eight houses, Rugby-road, for W. J. Ervine; shop and house, Templemore-avenue, for J. Gordon; shop and house, Great Victoria-street, for W. Breathwait; two houses, Park-avenue, for J. Johnston; house, Myrtlefield-park, for A. McDowell; alterations to premises, Chichester-street, for W. Brown & Sons; two houses, Ormiston-parade, for C. Dickey; five houses, Newtonwnards-road Upper, for J. Robinson; alterations to shop and store, Annadale-street, for R. Simpson.

BILLINGBOROUGH.—A new heating installation is to be installed at St. Andrew's Church, tenders for which are to be invited.

BISHOP AUCKLAND.—The U.D.C. Streets' Committee have received from the Durham County Surveyor a sketch plan showing a suggested new road in the district, at a cost of between £30,000 and £35,000, by way of Castle Chare to the Market-place. The cost to the U.D.C. will, it is thought, be between £5,000 and £7,000.

BLACKBURN.—On the recommendation of the Parks Committee, the T.C. have appointed a sub-committee to deal with the question of purchasing additional land adjoining a site at Knuzden, proposed to be bought by the Corporation, and to be used as playing fields, also to deal with the question of erecting a fence on such land. The Council approved of the sub-committee's proposal to construct an unclimbable fence and to purchase land at an estimated cost of £550, and have approved a recommendation of the Health Committee for an alteration to No. 8 and No. 9 slaughter-houses for uses as a head rate slaughter-house, at an estimated cost of £650.——Improvements are proposed by the Congregation of St. George's Presbyterian Church to the church and manse, estimated to cost about £2,000, and the funds have been provided.

BLACKPOOL.—Corporation are seeking sanction to commence building immediately 100 new houses on the Watson's-lane estate. Mr. E. D. Dennis is the architect.

BOLTON-ON-DEARNE.—The U.D.C. received sanction from the Ministry of Health for the erection of 20 more houses. These will be built in Barnburgh-lane and form part of a larger scheme.

BRADFORD.—Plans have been prepared and tenders are being invited for the reconstruction and conversion of premises in Hammerton-street, for the "Shell" Oil Syndicate. Included in the scheme is the construction of huge petrol storage tanks.

BRAMPTON.—Plans passed by R.D.C.: Four semi-detached bungalows at Faugh, for Granham & Son, Fenton.

BROMLEY.—Plans passed by R.D.C.: Mr. T. Stagg, cottage at St. Winifred's-road, Cudham; Mr. H. R. Jennings, house, Holwood Park-avenue, Farnborough; Mr. H. A. Pierpoint, two pairs semi-detached houses, Tower-road, Orpington; Mr. J. E. Blencowe, house with garage, Beckenham-road, West Wickham; Mr. J. Kent, three pairs semi-detached houses, Grosvenor-road, Ladywood Estate, Orpington.

BROOKWOOD.—Surrey C.C. has authorised the expenditure of £20,237 for the improvement of the nurses' quarters at Brookwood and Nethern Mental Asylums.

BURNLEY.—The question of the erection of a new super power electricity station is under consideration, estimated to cost £300,000.

BURTON-ON-TRENT.—The M.H. has approved the erection of 48 houses by the Corporation, and the Housing Committee has decided to erect an additional 48, subject to the approval of the T.C. and the Ministry.

CARLTON (NOTTS).—Plans passed by the Council included 11 houses and 5 bungalows.

CASTLEFORD.—Plans passed: Covered way into premises at the back of Carlton-street, for Messrs. Smith Bros.: nine houses in Smawthorne-lane, for Mr. L. J. Gallagher.

CASTLE WARD.—The M.H. have given sanction to the R.D.C. for the erection by private enterprise of 15 houses, by means of lump sum grants; and also approve of the Council's proposal to erect 15 houses at Dinnington and six at Ponteland, under the Housing Act.

CHICHESTER.—The West Sussex E.C. has approved an expenditure of £750 for the improvement of the heating arrangements at the High School for Girls.

CLOWNE.—The R.D.C. has approved plans of a public hall and institute which the Whitwell Miners' Welfare Committee propose erecting at Hangar Hill.

CONSETT.—The U.D.C. have approved plans for the erection of 285 houses by the Consett Iron Co., Ltd., in the Knitsley-lane neighbourhood.

COUNDON.—Sanction has been given by the M.H. for a loan asked for by the Bishop Auckland R.D.C. for the purpose of erecting houses at Coundon; and £648 for sewerage work in connection with these.

DARLINGTON.—Plans passed by T.C.: A. Chilton, bungalow and shop, Coniscliffe-road; W. W. Lee & Son, house, Woodland-road; F. Jackson, house, Linden-avenue; Bussey & Armstrong, eight houses, Haughton-road.

DARWEN.—The Corporation propose to submit to the M.H. for their approval plans for the erection of four cottages.

DERBY.—Mr. J. C. Dawes has held an inquiry in respect of an application by the T.C. to borrow £6,800 for a motor garage at the Ford-street Depot.

DUBLIN.—Plans passed: Additions to the Skin and Cancer Hospital, Hume-street, for the Hospital Governors; cooperage stores on Jones'-road, for the Dublin Distillery Co., Ltd.; extension of Boys' National School East-wall, for the Very Rev. Canon J. Brady, P.P.; reconstruction of premises, 24, Poole-street, for Messrs. Rogan & Co.

DURHAM.—The R.D.C. has approved of the proposal of Dorman, Long & Co. to build 50 houses at Bowburn.

EDINBURGH.—Warrants granted by Dean of Guild Court: Andrew Walker Bell, double house at Grant-avenue, Colinton; G. Dickson, convert self-contained house at Ferry-road, Leith, into four separate houses, and garages; Thomas S. Henderson, four bungalows off Hillview-terrace, Blackhall; Simon Keppie, jun., villa and garage at Lasswade-road; D. M. Duncan, 16 self-contained houses at Glebe-road, Corstorphine.

ESHER.—The U.D.C. has decided to erect 48 cottages.

FEATHERSTONE.—Plans passed by U.D.C.: Eight houses at Burston, for Mr. W. Sawyer, and Mistal at Loscoe Grange Farm, for Messrs. Hy. Briggs, Son & Co., Ltd.

GARSTANG.—The Highways Committee of the R.C. have under consideration the proposed improvements to Carr Bridge Stalmine estimated to cost £5,000.

GATESHEAD.—The T.C. have adopted a proposal of its Housing Committee to erect a further 100 houses.

GLASGOW.—The Clyde Trustees have obtained Government assistance for the provision of a new £2,000,000 dock for Glasgow.—Linings granted by Dean of Guild Court: William Cook, jun., 1,010 Pollokshaws-road, Crossmyloof, two double villas in Herries-road, Maxwell Park; Trustees of Shettleston and District Miners' Welfare Society, institute hall and offices in Amulree-street, Shettleston; Houston & Young, builders, Cochrane-s reet, Barrhead, double villa at Merrylee-road, Newlands; Duncan Campbell, 25, Mossgiel-road, Newlands, picture house at Paisley-road, at Halfway and corner of Elizabeth-drive, Mosspark.——New ground is to be broken in a projected building scheme, which has been prepared by Messrs. J. A. Mactaggart & Co., Ltd., building contractors, Glasgow, under which it is proposed to erect a number of five-apartment houses on ground at present forming part of the farm of Meikle Aikenhead, on the east of Carmunnock-road, Cathcart.

GRAYS.—The M.H. has sanctioned the erection of 50 more houses by the U.D.C.

GREASBOROUGH.—Plans prepared by Messrs. J. Simmons & Sons, Doncaster, for new sewage outfall works for the Mangham district, in place of the existing works at Greasborough, have been approved by the U.D.C.; and it has been decided to apply to the M.H. for a local inquiry to be held for a loan of £5,259 to carry out the scheme.——Plans passed: Two houses, Potter's-hill, for J. W. & E. Binns.

GREENOCK.—The T.C. is considering a scheme for new slaughter-houses, estimated to cost £60,000.

GUIDE BRIDGE.—The L.N.E.R. Co. have decided to increase the Marshalling yard at Dawsnap. Work will shortly commence on 27 additional sidings at an estimated cost of £34,000.

HASWELL.—The Easington R.D.C. has granted the Northern Sabulite Co., Ltd., of Darlington, permission to erect an explosives factory at Tuthill Quarry, Haswell.

HEXHAM.—Plans passed by R.D.C.: Bungalow for Miss S. E. Melville, near Edge House Farm, Barrasford; villa for Mr. R. W. Forster, Riding Mill; villa at The Eals, Corbridge, for Mr. R. T. S. Bertram.

HEYWOOD.—Sanction has been given by the M.H. for loan of £18,750 for the construction of new water mains in Heywood, Middleton, Chadderton and Morden, and the engineers have been instructed to obtain tenders for the work.

KING'S LYNN.—Plans passed by T.C.: New premises, High-street, for Messrs. Hepworths; 14 houses, Luke-road, for Mr. J. C. Horn.

LEEDS.—Plans have been prepared and approved for the erection of a four-story warehouse in Park-square. Each floor will have an area of 3,550 super yards. Tenders for this work are about to be invited by the architects, Messrs. J. Harper Bakes & Sons, Calverley Chambers, Leeds.

LINCOLN.—The Ironstone Area Church Extension Fund decided to proceed with the building of the naves of the Ashby and Crosby Permanent Churches. Under an agreed scheme between the Corporation and the local builders 300 houses are to be erected, each party erecting half of the total number.

LITTLE LEVER.—Application has been made to the M.H. by the D.C. for sanction to borrow £4,750 for the purpose of improvements at the Ginger Fold Sewage Disposal Works, which involves increased filtering area, new detritus tanks and improved arrangements for dealing with storm water.

LIVERPOOL.—Plans passed by the Corporation (the name of the the architects is given in parenthesis): Sub-station, Carlton-street, for Corporation Electric Supply Department (Land Steward and Surveyor); six lock-up garages, Olive Vale, for A. Harrison (Barlow Davies); one house, Queen's Drive, Mossley-hill, for R. J. Jones (J. W. Jones); two houses, Bellvair-road, for Selves (Mersey Building Co.); eight houses, Avonmere-avenue, for R. L. Burns (R. Owens & Son); new shops, offices and meeting room, Islington, for The Transport and General Workers' Union (Rees & Holt); new factory, Marybone, for J. E. Hughes (Travis & Co., Ltd.); two houses and garage, Beech-lane, for O. Owens (T. Wainwright & Sons); nine houses and shops, Long-lane, Garston, for David Roberts, Son, & Co. (R. Owens & Sons); 16 houses, Lanville-road, for Selves (Mossley Hill Estate, Ltd.); 22 lock-up garages, Aigburth-road, for W. Livesey (Turner & Moss); electric sub-station, Harrington-street, for Wright Crossley & Co. (Wm. Tomkinson & Sons); garage and house, Townsend-lane, for G. Linacre (Pritchard & Lewis); four houses and garages,

(*Continued on p.* 131.)

* See also our List of Contracts, Competitions, etc.

PRICES CURRENT OF MATERIALS.*

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.—Ed.]

BRICKS, &c.

Per 1,000 Alongside, in River Thames up to London Bridge.

	£ s. d.
Best Stocks	2 19 0
Second Hard Stocks	3 14 0

Per 1,000. Delivered at London Goods Stations.

	£ s. d.		£ s. d.
Fletton, at King's Cross	2 13 3	Best Blue Pressed Staffs.	9 0 0
Do. grooved for plaster	2 15 3	Do. Bullnose	9 10 0
Do. Bullnose	3 8 3	Blue Wire Cuts	7 0 0
Best Stourbridge Fire brick :—			
2½ in.	11 3 0	3 in.	13 2 0

GLAZED BRICKS—

Best White Ivory, and Salt Glazed Stretchers	22 0 0	D'ble Str'tch'rs	30 10 0
		D'ble Headers	27 10 0
		One Side and two Ends	31 10 0
Headers	21 10 0	Two Sides and one End	32 10 0
Quoins, Bullnose and 4½ in. Flats	28 10 0	Splays and Squints	30 0 0

Second Quality, £1 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours, light Glaze, £5 10s. extra over white.

BREEZE CONCRETE SLABS.

Delivered London.

	s. d.		s. d.
2 in. per yd. super	2 0	3 in. per yd. super	2 11
2½ in. "	2 6	4 in. "	3 6

	s. d.		
Thames Ballast	10 6	per yard.	delivered 2 miles radius Paddington.
Pit Sand	14 9	" "	
Thames Sand	15 6	" "	
Best Washed Sand	15 6	" "	
¾ in. Shingle for Ferro-Concrete	14 0	" "	
½ in. "	15 0	" "	
¾ in. Broken Brick "	10 6	" "	
Pan Breeze	5 6	" "	

Per ton delivered in London area in full van loads.

Best Portland Cement, British Standard Specification Test £2 18 0 to 51/- alongside at Vauxhall in 80-ton lots.	£3	3 6
Ferrocrete per ton extra on above	0	10 0
Super Cement	4	8 0
Roman Cement	8	15 0
Parian Cement	5	15 0
Keene's Cement, White	5	15 0
" " Pink	5	10 0
Plaster, Coarse, Pink	3	0 0
" " White	3	12 6
" Fine	5	12 0
Sirapite, Coarse	3	9 6
" Finish	3	17 6
Grey Stone Lime	2	10 9
Chalk Lime	2	10 9
Best Ground Blue Lias Lime	2	13 6
Hair	17	0 0
Granite Chippings	1	12 0

NOTE.—Sacks are charged 1s. 9d. each and credited 1s. 6d. if returned in good condition within three months, carr. pd.

Stourbridge Fireclay in sacks 35s. 0d. per ton at rly. dpt.

STONE.

	s. d.
BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube	2 9½
Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube	2 11½
PORTLAND STONE—	
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, L. & S.W.R., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube	4 4
Do. do. delivered on road wagons at above stations, per ft. cube	4 5
White basebed, 3d. per ft. cube extra.	
NOTE.—½d. ft. cube extra for every foot over 20 ft. *average*, and ½d. beyond 30 ft.	
HOPTON-WOOD STONE.	
Delivered at any Goods Station, London.	
Small random blocks, up to 10 ft. cube. Per ft. cube	7/-
Random blocks from 10 ft. and over "	17/-
Sawn two sides "	27/-
Sawn three or four sides "	32/-
YORK STONE, BLUE—*Robin Hood Quality.*	
Delivered at any Goods Station London.	s. d.
6 in. sawn two sides landings to sizes (under 30 ft. super.) Per Ft. Super	5 3
6 in. rubbed two sides, ditto "	5 9
3 in. sawn two sides slabs (random sizes) "	2 1½
2 in. to 2½ in. sawn one side slabs (random sizes) "	1 5½
1½ in. to 2 in. ditto, ditto "	1 3
HARD YORK—	
Delivered at any Goods Station London.	
Scappled random blocks Per Ft. Cube	5 6
6 in. sawn two sides landing to sizes (under 40 ft. super.) Per Ft. Super	5 4½
6 in. rubbed two sides ditto "	6 0½
4 in. sawn two sides slabs (random sizes) "	2 10
3 in. ditto. ditto "	2 5
2 in. self-faced random flags. Per Yard Super	7 11

ARTIFICIAL STONE.

Delivered in London Area in full van loads.	s. d.
Plain per ft. cube	6 6
Moulded " "	7 9
Cills " "	8 3

WOOD.

GOOD BUILDING DEAL.

Inches.	per stan.	Inches.	per stan.
4 × 11	£4 4 0	3 × 6	225 0
4 × 9	34 0	3 × 11	34 0
4 × 8	29 0	2 × 11	24 0
4 × 7	28 0	3 × 9	33 0
3 × 8	26 10	2½ × 9	33 0
3 × 7	26 0	3 × 4½	24 0
2½ × 7	26 0	3 × 4	24 0

WOOD (*Continued*).

PLANED BOARDS.

1 × 11	£38 10	1 × 9	£36 0

PLAIN EDGE FLOORING.

Inches.	per sq.	Inches.	per sq.
¾	21/-	1¼	33/6
¾	23/-	1½	38/6
1	26/6		

TONGUED AND GROOVED FLOORING.

Inches.	per sq.
1	26/6
1¼	33/6
1½	38/6

MATCHINGS (BEST).

Inches	per sq.
¾	17/6
¾	22/-
1	26/-

Inches	BATTENS	s. d.
¾ × 2		2 4 per 100 ft.

SAWN LATHS.

Per bundle				0 2 10
Dry Wainscot Oak, per ft. super, as inch	0 2 0	to	0 2 6	
¾ in. do. do.	0 1 6	to	0 2 0	
Dry Mahogany—Honduras, Tabasco, African, per ft. super, as inch	0 1 9	to	0 2 6	
Cuba Mahogany	0 3 0	to	0 3 6	
Teak (Rangoon, Moulmein or Java), per load	45 0 0	to	50 0 0	
American Whitewood planks, per ft. cube	0 14 0	to	0 16 0	
Best Scotch Glue, per cwt.	4 10 0	to	—	
Liquid Glue, per cwt.	4 7 0	to	5 10 0	

SLATES.

1st quality slates from Bangor or Portmadoc in truck loads delivered London area. Per 1,000 of 1,200.

	£ s. d.		£ s. d.
24 by 12	37 12 6	18 by 10	21 2 6
22 by 12	34 0 0	18 by 9	18 12 6
22 by 11	31 5 0	16 by 10	17 12 6
20 by 12	29 15 0	16 by 8	13 15 0
20 by 10	25 12 6		

TILES.

	Per 1,000 f.o.r. London. £ s. d.
Best machine-made tiles from Broseley or Staffordshire district	5 7 6
Ditto hand made ditto	5 12 6
Ornamental ditto	5 17 6
Hip and valley tiles (per dozen) { Hand made	0 9 6
Hip and valley tiles (per dozen) { Machine made	0 9

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—

	£ s. d.
R. S. Joists, cut and fitted	13 10 0
Plain Compound Girders	15 10 0
" Stanchions	17 10 0
In Roof Work	20 10 0

MILD STEEL ROUNDS.
To London Station, per ton.

Diameter.	£ s. d.	Diameter.	£ s. d.
⅜ in.	16 10 0	⅝ in. to ⅞ in.	13 10 0
½ in.	14 10 0	1 in. to 2½ in.	13 0 0

WROUGHT-IRON TUBES AND FITTINGS—
(Discount off List for lot of not less than £7 net value delivered direct from Works, 2½ per cent. less above gross discounts, carriage forward if sent from London Stocks.)

	Tubes.	Fittings.	Flanges.
Gas	52½%	52½%	62½%
Water	47½%	47½%	57½%
Steam	42½%	42½%	52½%
Galv'd—			
Gas	37½%	42½%	52½%
Water	31½%	37½%	47½%
Steam	25 %	32½%	42½%

C.I. HALF-ROUND GUTTERS—London Prices, ex Works.

Per yd. in 6 ft. lengths.	Gutters.	Angles and Nozzles.	Stop Ends.
2 in.	1/1½	11d.	3½d.
2½ in.	1/2½	1/0½	3½d.
4 in.	1/4	1/1½	3½d.
4½ in.	1/5½	1/4	4d.
5 in.	1/7½	1/5½	5d.
O.G. GUTTERS.			
3 in.	1/6½	1/2½	3½d.
3½ in.	1/6½	1/2½	3½d.
4 in.	1/7½	1/4	3½d.
4½ in.	1/9½	1/6½	4d.
5 in.	2/1½	1/9	5d.

RAIN-WATER PIPES, &c.

Per yd. in 6 fts.	Pipe.	Bends, stock angles.	Branches, stock angles.
2 in. plain	1/7½	1/1½	1/8
2½ in. "	1/9½	1/4	2/0½
3 in. "	2/1½	1/8	2/5½
3½ in. "	2/6½	1/11½	2/10½
4 in. "	2/11½	2/4½	3/5½

L.C.C. COATED SOIL PIPES—London Prices ex works.

	Pipe.	Bends, stock angles.	Branches, stock angles.
	s. d.	s. d.	s. d.
2 in. per yd. in 6fts plain	3 0½	2 2½	2 8
2½ in. "	3 6½	2 5½	3 3½
3 in. "	4 2½	2 8	4 0½
3½ in. "	4 7	3 3½	4 8½
4 in. "	5 1	3 9½	5 5

L.C.C. COATED DRAIN PIPES—London Prices ex works.

	Pipe.	Bends, stock angles.	Branches stock angles.
	s. d.	s. d.	s. d.
3 in. per yd. in 9ft. lengths	4 9	5 8	8 10
4 in. " "	6 3	6 8	11 4
5 in. " "	7 6	11 6	18 2
6 in. " "	8 10	14 4	23 5

	Per ton in London. £ s. d.		£ s. d.
IRON—			
Common Bars	13 10 0	to	14 10 0
Staffordshire Crown Bars—good merchant quality	14 0 0	..	15 0 0
Staffordshire "Marked Bars"	17 0 0	..	18 0 0
Mild Steel Bars	12 10 0	..	13 10 0

METALS (*Continued*).

	£ s. d.		£ s. d.
Steel Bars, Ferro-Concrete quality, basis price	13 0 0	..	14 0 0
Hoop iron, basis price	16 10 0	..	17 10 0
" Galvanised	31 0 0	..	32 0 0
Soft Steel Sheets, Black—			
Ordinary sizes to 20 g.	15 0 0	..	16 0 0
" " " 24 g.	16 0 0	..	17 0 0
" " " 26 g.	18 0 0	..	19 0 0
Sheets Flat Best Soft Steel, C.R. & C.A. quality—			
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	21 10 0	..	22 10 0
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 22 g. and 24 g.	22 10 0	..	23 10 0
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 26 g.	24 10 0	..	26 10 0
Flat and Galvanised Corrugated Sheets—			
Ordinary sizes, 6 ft. to 9 ft. to 20 g.	21 10 0	..	22 10 0
Ordinary sizes, 6 ft. to 9 ft. to 22 g. and 24 g.	22 0 0	..	23 0 0
Ordinary sizes, 6 ft. to 9 ft. to 26 g.	24 0 0	..	25 0 0
Sheets Galvanised Flat, Best quality—			
Best Soft Steel Sheets, 6ft. by 2ft. to 3ft. to 20g. and thicker	23 10 0	..	24 10 0
Best Soft Steel Sheets, 22 g. and 24 g.	24 10 0	..	26 10 0
Best Soft Steel Sheets, 26 g.	26 0 0	..	27 0 0
Cut Nails, 3in. to 6 in. (under 3in. usual trade extras.)	20 10 0	..	22 0 0

METAL WINDOWS—Standard sizes suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 1/4 to 1/7 per foot super.

LEAD, &c.

(Delivered in London.)	£ s. d.
LEAD—Sheet, English, 4 lb. and up	41 10 0
Pipe in coils	42 0 0
Soil Pipe	45 0 0
Compo pipe	47 10 0

NOTE—Country delivery, 30s. per ton extra; lots under 3 cwt., 2s. per cwt. extra and over 3cwt. and under 5 cwt., 1s.6d. per cwt. extra. Cut to sizes, 2s. cwt. extra.

Old lead, ex London area, at Mills per ton	27 0 0	..	—
Do., ex country, carriage forward per ton	28 0 0	..	—

PLUMBERS' BRASS WORK.
Delivered in London.

NEW RIVER PATTERN SCREW DOWN BIB COCKS FOR IRON.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
29/	45/-	76/-	153/-	246/-	510/- per doz.

NEW RIVER PATTERN SCREW DOWN STOP COCKS AND UNIONS.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
41/6	62/-	92/-	174/-	300/-	588/- per doz.

NEW RIVER PATTERN SCREW DOWN MAIN FERRULES.

½ in.	¾ in.	1 in.
39/6	60/-	116/6 per doz.

CAPS AND SCREWS.

1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
7/6	10/-	14/-	23/-	30/-	42/- per doz.

DOUBLE NUT BOILER SCREWS.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2in.
7/6	11/6	17/-	29/-	36/-	63/- per doz.

BRASS SLEEVES.

1¼ in.	2 in.	3 in.	3½ in.	4 in.
10/-	12/-	20/-	24/-	31/- per doz.

NEW RIVER PATTERN CROYDON BALL VALVES, S.F

½ in.	¾ in.	1 in.	1¼ in.	1½ in.
35/-	56/-	98/-	162/-	228/- per doz.

DRAWN LEAD P. & S. TRAPS WITH BRASS CLEANING SCREW.

	1½ in.	1½ in.	2 in.	3 in.
8 lbs. P. traps	33/-	41/-	56/-	101/- per doz.
8 lbs. S. traps	35/-	45/-	66/-	126/- "

COPPER—	£ s. d.		
Strong Sheet per lb	0 2 3	..	—
Thin " "	0 2 4	..	—
Copper nails "	0 2 3	..	—
Copper wire "	0 2 4	..	—
TIN—English Ingots "	0 2 6	..	—
SOLDER—Plumbers' "	0 1 1	..	—
Tinmen's "	0 1 3	..	—
Blowpipe "	0 1 5	..	—

PAINTS, &c.

	£ s. d.
Raw Linseed Oil, in pipes per gallon	0 3 10
" " " in barrels "	0 4 0
" " " in drums "	0 4 3
Boiled " " in barrels "	0 4 4
" " " in drums "	0 [illegible]
Turpentine in barrels "	0 6 8
" in drums (10 gall.) "	0 6 11
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)	56

GENUINE WHITE LEAD PAINT—
"Father Thames," "Nine Elms," "Park," "Supremus," "St. Paul's," "Spedol" and other best brands (in 14 lb. tins) not less than 5 cwt lots per ton delivered 79 10 0

Red Lead, Dry (packages extra) per ton	43	0 0
Best Linseed Oil Putty per cwt.	0	18 0
Filocot per cwt.	0	15 6
Size, XD Quality fkn.	0	3 6

[Concluded on next page.]

* The information given on this page has been specially compiled for THE BUILDER and is copyright. Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

PRICES CURRENT OF MATERIALS (*contd.*)

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

	Per Ft.		Per Ft.
15 oz. fourths....	3½d.	32 oz. fourths	8½d.
15 „ thirds	4½d.	32 „ thirds	10½d.
21 „ fourths ..	5d.	Obscured Sheet, 15 oz.	4d.
21 „ thirds	6½d.	„ „ 21 „	5½d.
26 „ fourths ..	6d.	Fluted 15oz. 6½d., 21oz.	9½d.
26 „ thirds	7½d.	En'lled 15oz. 5½d., 21oz.	7½d.

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE IN CRATES OF STOCK.

SIZES.	Per Ft
⅛ Rolled plate	4½d.
¼ Rough rolled	5½d.
⅜ Rough rolled	5½d.
Figured Rolled, Oxford Rolled, Baltic, Oceanic, Arctic, Stippolyte, and small and large Flemish white	6½d.
Ditto, tinted	9d.
Rolled Sheet	6d.
White Rolled Cathedral	5½d.
Tinted do.	7½d.

Cast Plate is same price as rough rolled.

VARNISHES, &c.

		Per gallon £ s. d.
Oak Varnish	Outside	0 14 0
Fine ditto	ditto	0 16 0
Fine Copal	ditto	0 18 0
Pale Copal	ditto	1 0 0
Pale Copal Carriage	ditto	1 4 0
Best Ditto	ditto	1 12 0
Floor Varnish	Inside	0 18 0
Fine Pale Paper	ditto	0 18 0
Fine Copal Cabinet	ditto	1 2 6
Fine Copal Flatting	ditto	1 0 6
Hard Drying Oak	ditto	0 18 0
Fine Hard Drying Oak	ditto	0 19 0
Fine Copal Varnish	ditto	1 0 0
Pale ditto	ditto	1 2 0
Best ditto	ditto	1 12 0
Best Japan Gold Size		0 12 0
Best Black Japan		0 12 0
Oak and Mahogany Stain (water)		0 12 0
Brunswick Black		0 9 0
Benin Black		0 14 0
Knotting (patent)		1 5 6
French and Brush Polish		0 17 0
Liquid Dryers in Terebine		0 9 0
Cuirass Black Enamel		0 7 0

NEW BUILDINGS IN LONDON.

Hackney.—MISSION HALL.—A new Wesleyan Central Mission Hall and Institute are to be erected in Mare-street. The architects for the work are Messrs. Gunton & Gunton, of Finsbury House, E.C. 2.

Essex-street. — OFFICES. — Offices are being built in Essex-street, Strand, W.C. 2, for Messrs. Oerlikon, Ltd., of 34, Norfolk-street. The architects for the work are Messrs. Gunton & Gunton, of Finsbury House, E.C. 2.

Cornhill.—OFFICES.—A new block of offices is now being erected for the Union Insurance Society of Canton, Ltd., at 78–80, Cornhill, E.C. The two fronts are built of granite up to the second floor, with Portland stone for four floors above, and then two further floors in the Mansard roof. The building also has a lower ground floor and basement. Messrs. Bovis, Ltd., of 43, Upper Berkeley-street, W.1, are the builders; Messrs. Somerville-Barnard are doing the steelwork; Messrs. Seigwarts, floors throughout; Messrs. Jenkins, of Torquay, marble and granite wall linings; Messrs. Crittalls, windows; Waygood, lift; Messrs. Gunton & Gunton, Finsbury House, E.C.2, are the architects for the work.

Obituary.

The death has occurred at Scarborough of Mr. Wm. Garbutt Miers, aged 77, a retired builder and contractor.

The death occurred, on January 14, of Mr. John Mauchlen, of Moorside, Fenham, Newcastle, a member of the firm of Messrs. G. H. Mauchlen, builders and contractors, of that city. He was a director of the Fenham Building Estate.

The death has taken place of Mr. Evan Matthews, builder and contractor, Aberkenfig (Glam), at the age of 78 years.

PROPOSED NEW BUILDINGS.

(*Continued from page* 129.)

Menlove-gardens, for R. J. Jones (J. W. Jones); house and garage, Harthill-road, for T. N. Thomas (E. Russell Taylor); gardener's cottage, Allerton-road, for Major Tod (Morton & Dobie); house and garden, Menlove-gardens, for J. Clarkson (J. W. Jones); 10 houses, Dudlow-lane, for Self (J. W. Jones); two houses and garages, Sinclair-drive, for T. Jones (Gray & Evans); masonic hall, Island-road, Garston, for Garston Masonic Hall Co., Ltd. (E. B. Bailey); new workshop, Jasper-street, for J. Atherton (D. J. Nixon); rebuilding premises, Eccles-street, for Vauxhall Tanning Co. (R. Routledge); 52 houses, Stanley-gardens, for W. H. Furphey (A. Meadow); conversion to flats, Willesley-terrace, for C. Porter (G. H. Ashurst); conversion to flats, Sunnyside, Princes Park, for A. Fry (Campbell & Honeyburne); 24 houses, Uttingavenue, for J. Hughes (S. A. Kelly); 50 houses, New road off, for J. Hughes (S. A. Kelly); 272 houses, Hulton's-lane and 5, New-road, adjoining, for R. Jones & Co. (T. Wainwright & Sons).

LLANELLY.—The M.H. has sanctioned a loan by the B.C. for building 60 new houses at Llanerch. The loan is £27,000.

LONDON (CHELSEA).—The New Prince's Ice Rink Co. have secured a site covering 60,000 ft. in King's-road, Chelsea, for a new ice rink, club, winter garden, and restaurant, and plans have been prepared for a £50,000 building.

LONDON (LEWISHAM).—Plans passed by B.C.: Edmonds & Beale, eight houses, Woolstone-road; E. C. Christmas, 17 garages and office, Sydenham-park; L.C.C., addition to school, Elfrida-crescent; E. King, factory, Honor Oak-road; W. Pamphilon, factory, Algernon-road; H. D. Bennett, house, 1, Avenue, Grove Park.

LYTHAM ST. ANNES.—Sketch plans for a public hall and public baths to be erected on the site of the present baths and Council offices at Lytham have been approved by the Town Council. The baths portion of the scheme is to be proceeded with at once, and the Borough Surveyor has been requested to draw up estimates, &c.

MALVERN.—Plans passed: New entrance gates to Malvern College, in Woodshear-road; new residence, adjoining Golf Club House at Malvern Common, for Mr. E. C. Mann; and new residence in St. Peter's-road, for Mr. J. Mason.

MANCHESTER.—Plans passed by the Corporation: Hardy & Co., Ltd., revised plan of steelwork to premises, Victoria-street and Gateston-street; Failsworth Golf Club, clubhouse, Moston-lane, Moston; A. Wykeham & L. Gibson, two houses, Hill lane, Blackley; H. Bradshaw, 16 houses, Hill lane, Blackley; E. Nove, details of steel roof to works, Sidney street and York street, Chorlton upon Medlock; Manchester Crematorium Authorities, addition to Manchester Crematorium, Barlow Moor road, Chorlton cum-Hardy; Walker & Homfrey, Ltd., details of reinforced concrete construction, addition to brewery, Denmark-road, Moss Side; J. Scott, 20 houses, Beaumont-road and Belgrave-road, Chorlton-cum-Hardy; M. Kanton, two shops and houses, Lloyd-street South, Withington; Mrs. M. H. Gaffrey, six houses, Wilbraham-road and Morville-road, Chorlton-cum-Hardy. ——The Housing Committee proposes to arrange for the erection of 2,000 houses by builders, under the subsidy scheme.

MELTHAM.—Plans passed by U.D.C.: Bakehouse in Etherd Fold, for Mr. H. Sykes.

MEXBOROUGH.—The allotments in Adwick-road, near the Montagu Hospital, have been acquired by a local builder for the erection of 100 houses by private enterprise. The Council having received sanction for the erection of 44, are proceeding with the erection of 33.

MOTHERWELL.—Unusual activity prevails in the building trade in the district. At the recent Dean of Guild Court plans were passed for the erection of private dwellings and cottages amounting to £12,000.

NEW ROMSEY.—Plans passed by T.C.: House, Littlestone-road, for Messrs. Lacey & Jackson, Ashford.

NEWBURN.—The U.D.C. have resolved to apply to the M.H. for permission to borrow £1,600 for the widening of Union Hall-road, Lemington.

NORTHAMPTON.—An application is being made for sanction to raise a loan of £4,313 16s. 6d. to cover the expenditure of the construction of roads on the south and east sides of Far Cotton recreation ground. The Maternity and Child Welfare Committee have decided to transform St. Giles Mission Room, Dychurch-lane, into a Maternity and Child Welfare Centre at a cost of £700. Application is being made for sanction of a loan of £2,347 5s. 5d. in respect of the construction of roads and sewers on the site of a new school at St. James' End; also a loan of £1,500 to purchase a site at Far Cotton for a new school.——Plans passed by T.C.: New isolation block, General Hospital, for Mr. F. W. Dorman.

OLDHAM.—The Trustees of the Honeywell-lane Primitive Methodist Church are proposing to erect a new church, estimated to cost £4,500 and building is to commence in the near future. Pastor the Rev. W. P. Porter. Messrs. Dixon Hill & Co., architects, Oldham, have prepared the plans. Approval has been given by the Surveyors, and Building Committee of the Corporation for the clearance of the slum area of Smethurst-street, Grosvenor-street and West-street (approximately 4¼ acres) and to erect thereon 300 dwellings. The drawing of plans for these latter would be open to competition amongst architects, to whom it is proposed to offer prizes of £100, £50, and £25. The Town Clerk is Mr. J. J. Williams.——Plans approved by the Council: Mr. J. Kemble, two houses, Sheepfoot-lane, Hollins Green; Messrs. A. Pellowe & Sons, 10 houses, Manley-road.

OSWALDTWISTLE.—The D.C. have appointed a subcommittee to go into the question of provision of new plant at the Gas Works. Plans passed by the D.C.: Miss Alice Bury, house, Stanhill-lane; Messrs. W. H. Bury & Son, Ltd., eight houses, Alice-street; Mr. W. Clegg, 6 houses, Duke-street; Mr. Milton Gregson, plan of streets, Broadfield.

PADIHAM.—The Housing Committee of Padiham U.C. have recommended the erection of 12 houses at an estimated cost of £475 per house on the Drysden site.

PATELEY BRIDGE. — Plans passed by R.D.C. Bungalow, Smelthouse-lane, for Messrs. H. P. Cooper.

PONTEFRACT.—Plans passed by T.C.: House at Townville, for the Airedale Collieries, Ltd.; fish and chip restaurant in Bondgate, for Mrs. D. Glover; house in Southgate, for the Conservative Club; house at Townville, for Mr. P. Champion; two houses in Spital Hardwick-lane, for Messrs. Howson & Clark; house in Colonel's-walk, for Mr. Bacon.——Plans passed by R.D.C.: 20 houses at Brotherton, for the Council.

POULTON.—Application is to be made to the M.H. for sanction to borrow £1.270 for the purchase of land at Lower Green for the purpose of housing.

PRESTON.—The Health Committee of the B.C. have recommended the proposed extensions to the Chestnut Sanatorium, estimated to cost £13,000, subject to the approval of the M.H. Plans for 67 houses and three bungalows have been passed by the Corporation.

ROBROYSTON COLLIERY.—Plans for the erection of 124 houses at Robroyston Colliery have been approved by the Lower Ward District Committee of Lanarkshire. The proposed houses are to be built by Messrs. John Watson, Ltd., 19, St. Vincent-place, Glasgow, and comprise one and two-story cottages. The plans provide for 100 houses of two apartments and 24 houses of three apartments, all with scullery, washhouse, bath and other modern conveniences.

ROYTON.—Plans passed by the D.C.: Extension of mill premises, for the Empire Mill, Turf-lane.

RUGELEY.—Plans passed by R.D.C.: Bungalows, New-road, for Mr. Pedley and Mrs. Stokes; two cottages Green-lane, for Mr. C. Mason; two cottages, Sandy-lane, for Mr. Smith.

RYTON.—At the last meeting of the U.D.C. Messrs. J. & W. Dixon submitted a block plan for 30 houses at Scalburns, and plans for six houses, the plans being approved.

SHOEBURYNESS.—Subject to sanction the U.D.C. will erect two cottages at the Gasworks.

SILLOTH.—With a view to encouraging private enterprise in the building of more houses, the Holme Cultram R.D.C. have decided, subject to the approval of the M.H., to offer free sites on the surplus land of their housing site at Silloth to people building houses there in conformity with the Housing Act, 1923.

SKEGNESS.—Plans passed include a rest home for the employees of Messrs. J. B. Lewis & Sons, Ltd., Nottingham, the site being at the Winthorpe end near the sea.

SOUTH LINCOLNSHIRE.—Activity in house building prevails in this area, as the following programme of the various Councils in the district shows: Spalding U.D.C. are to erect an additional 30 houses and the R.D.C. another 24 houses; East Elloe, (Holbeach) R.D.C. are to erect 32 houses; Boston R.D.C. are to erect seven pairs of houses; Bourne R.D.C. are also to erect further houses.

STOURPORT.—Plans passed: Thirteen houses in Kidderminster-road and Warwick-street, for Mr. Shepherd.

STRETFORD.—Plans passed by U.D.C.: 14 houses, Derbyshire-lane West, &c., for Mr. Thomas Pollock.

THORNE.—At a meeting of the R.D.C. the approval of the M.H. was received for the erection of 400 houses in the district by private enterprise, such houses to be eligible for the subsidy of £75 per house. The question of the erection of houses by the Council under the provisions of the Housing Act, 1923, was considered, and it was decided to submit a scheme, comprising 48 houses to be built at Thorne.

THURNSCOE.—The M.H. has inquired into the application of the U.D.C. to borrow £11,700 for extensions to the water undertaking.

TIVERDALE.—The Upper Stour Valley Main Sewerage Board has passed plans for the improvement of the outfall works at Tividale at an estimated cost of over £5,000.

TRURO.—Plans for the erection of twenty houses at Newham, Truro, have been prepared, and the City Council is making application to the M.H. for sanction to start building forthwith.

WALLSEND.—The Housing and Town-Planning Committee report that they have secured the approval of the M.H. to the proposals of the T.C. in regard to affording financial assistance to private enterprise in the erection of houses to the number of 200, which are likely to be commenced prior to March 31.——The T.C. have agreed to offer a price not exceeding £350 per acre for the acquisition of the golf course for a housing site.

WELLINGBOROUGH.—The U.D.C. has passed plans for a bungalow in Leys-road, two houses in Gisburne-road, two houses in Robert-street, and 12 houses on the Swanspool estate.

YEADON.—The U.D.C. is acquiring the Henshaw-lane housing site, which will allow of the erection of 51 houses.

FIRES.

DORKING.—The Dorking Electric Laundry has been almost completely destroyed by fire.

HORNSEY.—The church of St. Augustine, facing Archway-road, Hornsey, at the corner of Langdon Park-road, has been destroyed by fire.

SUNDERLAND.—Considerable damage has been caused by fire to the tallow factory at Dunning-street, owned by Mr. W. D. Humphries

Town Planning.

The Town Clerk, Manchester, informs us that a book containing all the proceedings of the Town Planning Conference recently held at Manchester has been issued, and can be obtained from him on the payment of 8s. 6d., post free in England.

CURRENT PRICES FOR BUILDING WORK IN LONDON.*

EXCAVATOR.

		s.	d.
Digging and throwing or wheeling and filling carts, and carting away to shoot—6 ft. deep	per yard cube	11	6
Add if in clay	" "	1	0
Add for every additional depth of 6 ft.	" "	0	6
Planking and strutting to trenches	per foot super	0	5
Do. to sides of excavation, including shoring	" "	1	0

CONCRETOR.

Portland cement concrete in foundation 1 to 6	per yard cube	35	0
Add if in underpinning in short lengths	" "	7	6
Add if in floors 6 in. thick	" "	3	6
Add if in beams	" "	4	0
Add if aggregate 1 : 2: 4	" "	10	0
Add for hoisting not exceeding 10 ft. beyond the first 10 ft.	" "	3	3

BRICKLAYER.

		£	s.	d.
Reduced brickwork in lime mortar and Fletton bricks	per rod	30	0	0
Add if in stocks	"	7	10	0
Add if in Staffordshire blues	"	22	0	0
Add if in Portland cement and sand	"	2	0	0

FACINGS.

Extra for facing in English or Flemish bond for every 10s. per 1,000 over the price of the common bricks	per ft. super	0	0	1½

POINTING.

Neat flat struck or weathered joint	" "	0	0	3

ARCHES.

Extra only to the price of ordinary brickwork :—

Fair external in half brick rings	" "	0	0	10
Axed in stocks	" "	0	1	9
Rubbed and gauged jointed in putty camber or segmental	" "	0	6	0

SUNDRIES.

Damp course in double course of slates breaking joint and bedded in Portland cement	" "	0	1	1
Setting ordinary register grates and stoves	each	1	0	0
Setting kitchener, including forming flues, &c., with all necessary fire bricks	"	4	15	0

ASPHALTER.

		s.	d.
Half-inch horizontal damp course	per yard sup.	4	3
Three-quarter-inch vertical damp course	" "	9	0
¾ inch on flats in two thicknesses	" "	6	6
Angle fillet	per foot run	0	3
Skirting and fillet 6 in. high	" "	1	3

MASON.

York stone templates fixed	per foot cube	12	6
York stone sills fixed	" "	21	6
Bath stone and all labour fixed	" "	10	6
Portland stone fixed	" "	19	6

SLATER.

Welsh 16 in. × 8 in. 3 in. lap, including nails	per square	72	9
Do. 20 in. × 10 in. Do. Do.	"	80	9
Do. 24 in. × 12 in. Do. Do.	"	90	0

CARPENTER AND JOINER.

Fir framed in plates	per foot cube	5	3
Do. joists	" "	5	9
Do. roofs, floors and partitions	" "	6	3
Do. trusses	" "	8	3

		¾"	1"	1¼"	2"
Deal rough close boarding	per sq.	38/-	44/-	50/-	80/-

		s.	d.
Flat centering for concrete floor, including struts or hangers	"	50	0
Do. to beams	per ft. sup.	1	0
Centres for arches	"	1	6
Gutter boards and bearers	"	1	0

FLOORING.

		¾"	1"	1¼"	1½"
Deal-edges shot	per sq.		49/-	58/-	67/-
Do. tongued and grooved	"		54/-	65/-	72/-
Do. matchings	"	45/-	55/-		
Moulded skirting, including backings and grounds	per ft. sup.	1/6	1/9	2/0	2/6

SASHES AND FRAMES.

		s.	d.
One-and-a-half moulded sashes or casements	per foot super	1	10
Two Do. Do. Do.	" "	2	1
Add for fitting and fixing	" "	0	4
Deal-cased frames with 1 in. inner and outer linings, 1½ in. pulley stiles tongued to linings, hard wood sills with 2 in. moulded sashes in squares double hung, double hung with pulleys, lines and weights; average size	" "	3	9

DOORS.

		1½"	1¾"	2"
Two-panel square framed	per ft. sup.	2/1	2/4	2/6
Four-panel Do.	"	2/5	2/8	2/11
Two-panel moulded both sides	"	2/8	2/11	3/2
Four-panel Do. Do.	"	2/11	3/2	3/5

CARPENTER AND JOINER—continued.

FRAMES.

		s.	d.
Deal wrot moulded and rebated	per foot cube	14	0

		1"	1¼"	1½"
Plain deal jamb linings framed	per ft. sup.	1/8	1/9	2/0
Deal shelves and bearers	"	1/5	1/7	1/10
Add if cross tongued	"	2d.	2d	2d.

STAIRCASES.

	1"	1¼"	1½"	2"	2½"
Deal treads and risers in and including rough brackets	2/1	2/4	2/9	—	—
Deal strings wrot on both sides and framed	1/8	2/-	2/2	2/8	—

		s.	d.
Housings for steps and risers	each	0	11
Deal balusters, 1 in. × 1¼ in.	per ft. run.	0	9
Mahogany handrail; average 3 in. × 3 in.	" "	6	0
Add if ramped	" "	11	10
Add if wreathed	" "	23	9

FIXING ONLY IRONMONGERY (INCLUDING SCREWS).

6 in. barrel bolts	8½d.	Rim locks	2/4
Sash fasteners	11½d.	Mortice locks	5/3
Casement fasteners	1/5	Patent spring hinges and letting in to floor and making good	19/-
Casement stays	1/2		
Cupboard locks	1/5		

FOUNDER AND SMITH.

		s.	d.
Rolled steel joists	per cwt.	17	0
Plain compound girders	"	20	0
Do. stanchions	"	23	0
In roof work	"	28	0

RAIN-WATER GOODS.

		3"	4"	5"	6"
Half-round plain rebated joints	ft. run	1/11	2/4½	3/7	4/-
Ogee Do. Do.	"	2/4½	3/1	3/1	4/9
Rain-water pipes with ears	"	2/9	3/7		
Extra for shoes and bends	each	4/4	5/11		
Do. stopped ends	"	1/11	2/4½	3/7	4/-
Do. nozzles for inlets	"	2/2	2/7	3/10	4/3

PLUMBER.

		s.	d.
Milled lead and laying in flashings and gutters	per cwt	54	0
Do. Do. in flats	"	52	0
Extra labour and solder in coated cesspools	each	6	9
Welt joint	per ft run.	0	6
Soldered seam	" "	1	6
Copper nailing	" "	0	6

		¼"	⅜"	1"	1½"	2"	4"
Drawn lead waste	per ft. run	11d.	1/8	1/11	3/5	4/2	
Do. service	"	1/7	2/1	2/6	3/10		
Do. soil	"						6/10
Bends in lead pipe	each					3/3	8/2
Soldered stop ends	"	1/2	1/8	2/1	2/10	3/6	
Red lead joints	"	11d.	1/-	1/3	1/11	2/4	4/10
Wiped soldered joints	"	2/10	3/6	4/-	4/11	6/6	9/9
Lead traps and cleaning screws	"				14/7	19/6	
Bib cocks and joints	"	6/4	9/7	15/4	41/-		
Stop cocks and joints	"	15/4	17/2	25/8	64/-		

PLASTERER.

			s.	d.
Render, float and set in lime and hair	per yard sup.		2	3
Do. Do. Sirapite	" "		2	6
Do. Do. Keen's	" "		3	6
Add sawn lathing	" "		1	5
Add metal lathing	" "		2	3
Portland cement screed	" "		1	10
Do. plain face	" "		3	0
Mouldings in plaster	per 1 girth		0	1½
One-and-a-half granolithic pavings	per yard sup.		5	9

GLAZIER.

			s.	d.
21 oz. sheet plain	per foot sup.		0	9
26 oz. Do.	" "		1	1
Obscured sheet	" "		1	3
¼ in. rolled plate	" "		0	9
¼ in. rough rolled or cast plate	" "		0	11
¼ in. wired cast plate	" "		1	5

PAINTER.

			s.	d.
Preparing and distempering, 2 coats	per yard sup.		0	9
Knotting and priming	" "		0	7
Plain painting 1 coat	" "		0	9
Do. 2 coats	" "		1	2
Do. 3 coats	" "		1	9
Do. 4 coats	" "		2	4
Graining	" "		2	3
Varnishing twice	" "		1	9
Sizing	" "		0	3
Flatting	" "		0	7
Enamel	" "		1	1
Wax polishing	per foot sup		0	6
French polishing	" "		1	2
Preparing for and hanging paper	per piece	2/- to	4/-	

* These prices apply to *new buildings only*. They cover superintendence by foreman and carry a profit of 10% on the prime cost without establishment charges. A percentage of 1½ should be added for Employers' Liability and National Health and Unemployment Acts and from 1s. 6d. per £100 for Fire Insurance. The whole of the information given on this page is copyright.

TRADE NEWS.

On the occasion of the formation of the new company, at the beginning of this year, Messrs. F. McNeill & Co., Ltd., send us a few interesting particulars of their past activities. They were the original patentees and manufacturers in 1833 of the felts known as tarred felts, and under this designation are included asphaltic roofing, sarking, black sheathing felt, inodorous felt (Nos. 1 & 2), brown sheathing felt, and shoemakers' felts. The original trade mark is the "Lion," and their felts are well-known by the advertisement of "Lion" brand. They also manufacture Slagbestos, which is the trade mark under which they now sell McNeill's patent slag wool "Lion" brand, which is the finest non-conducting material in existence.

It is interesting to note that their asphaltic roofing was used for covering the huts, hospitals, &c., during the Crimea War. By special command of Her late Majesty, Queen Victoria, the pavilion at Aldershot was entirely covered by Messrs. F. McNeill & Co., Ltd., who were also the sole contractors for roofing the Great International Exhibition building of 1862. In later days, millions of yards of roofing have been supplied to the devastated regions after the earthquake in Messina and the recent calamity in Japan; as well as for the covering of huts, hospitals, canteens, &c., during the Great War (1914–1918).

Messrs. MacAndrews & Forbes, Ltd., the proprietors of the well-known wall-board, "Fiberlic," are removing from 65, South Molton-street to larger and more central and convenient offices at Bush House, Aldwych, W.C. 2.

We have received from Messrs. The "Woco." Door Co. an illustrated catalogue. It shows, in a very convincing manner, the quality of the wood used for Columbian pine doors.

The certificate of the Incorporated Institute of Hygiene has been awarded to the Fairfield Paint Co., of the London Colour Works, Mile End, E., stating that the Fairfield Washable Distemper has been passed by the examining Board as fulfilling the Standard of Hygiene Merit required by them.

We have received from Messrs. George Wright (Rotherham), Ltd., a copy of their stainless steel booklet. It is the first of its kind entirely devoted to stainless steel goods other than cutlery.

A new list has been issued by the Birnwell Iron Co., Ltd., of 1, Regent-street, S.W. 1, describing and illustrating the "Birnwell" hot-water boiler and stove, which from one fire provides a constant hot-water supply, warms the house, and provides ample facilities for cooking. This boiler and stove embodies many improvements and special features, making for economy in fuel and saving in labour, and has the additional advantage that it will burn smokeless fuel and house refuse.

The Midland Joinery Works, Ltd., inform us that negotiations have now been completed for the purchase of the softwood section of Messrs. Charles Perks & Sons, Ltd., Lichfield-street, Burton-on-Trent, with the extensive plant, buildings, &c. Additional plant, buildings and offices are now being erected, upon completion of which the registered office of the company will be transferred from Shobnall-road to Lichfield-street; the Shobnall-road premises being retained as a branch works. Messrs. Charles Perks & Sons are continuing the Oak Stave branch of their business from their present offices, as heretofore.

We have received from Messrs. The Midland Joinery Works, Ltd., a schedule of prices of joinery timber mouldings. It will be sent post free on the receipt of 6d.

We are informed by Mr. H. Johnston Thomas, builders' merchant, 11, Duke-street, London Bridge, S.E. 1, that he has now arranged for additional telephone facilities, and his new numbers are Hop 6550 and 6551.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach him not later than Tuesday evening.
* Denotes *accepted*. † Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modifications*.

ABERYSTWYTH.—The M.H. has approved acceptance of following tender by T.C., for erection of seven houses at Glanrafon site:—
J. E. Morgan Jones & Co., Oswestry £2,766

BARNSLEY.—For repairs to Champeny-hill reservoir, for the T.C.:—
*Cementation Co. £385

BELFAST.—For extension of tramway track along Chichester-street, &c., for the T.C.:—
*John Graham, Dromore..... £31,912 14 11

BIRKENHEAD.—Erection of electricity substation at Woodchurch-road, for the T.C.:—
*W. E. Hughes, Birkenhead..... £1,445

BIRKENHEAD.—For making-up (*a*) Daffodil-road, and (*b*) Primrose-road, for the T.C.:—
*C. L. Warren, Wallasey (*a*) £909 6s. 4d. and (*b*) £895 16s.

BLYTH.—For erection of 50 houses, for the T.C. Borough Engineer, Blyth:—
A. R. Robertson, Blyth £24,532 0
J. W. Tebble, Blyth 22,364 15

BOSTON.—Erection of pair of cottages in each of the parishes of Old Leeke, Leverton and Butterwick, for the R.D.C.:—
*F. Evison ..... £690 per pair

BOSTON.—Erection of two pairs of houses at Bicker, for the R.D.C.:—
*Mowbray ..... £780 per pair

BRADFORD.—For cleaning and painting work at Pathological Laboratory, for the T.C.:—
*Taylor & White £105 16 8

BRADFORD.—For painting and cleaning work at Cartwright Memorial Hall, for the T.C.:—
*E. Harland & Sons £250

BRECON.—For erection of a lavatory for the T.C.:—
*A. H. Taylor & Son £166

CHELTENHAM.—For the erection of 15 pairs of non-parlour type houses, for the T.C.:—
*W. Drew ..... £400 per house

CHIPPENHAM.—For decoration of the Town and Neeld Halls, for the T.C.:—
*Downing & Rudman £337

CHORLEY.—For conversion of buildings in Astley Park into tea-rooms and lavatories, for the T.C. Town Clerk, Council Offices, Chorley:—
*J. R. Lucas & Sons, Chorley.

COLCHESTER.—For erection of (*a*) 12 non-parlour houses, and (*b*) two parlour houses, for the T.C.:—
H. Allston—(*a*) £4,175, and (*b*) £889 18s.

DURHAM.—Construction of roads and sewers at Ushaw Moor housing site, for the R.D.C.:—
*T. Hilton & Sons, Bishop Auckland.. £1,037

DURHAM.—For erection of 16 houses, at Framwellgate Moor, for the R.D.C.:—
*Ainsley Bros., Durham ..... £370 per house

FALMOUTH.—For erection of 20 houses on Penwerris site, for the T.C. £9,071

FAREHAM.—For alterations to master's quarters at the Institution, for the Board of Guardians:—

James Crockerell, Southsea	£1,640	0	0
H. G. Ross, Netley Abbey	1,600	0	0
A. Fry, Fareham	1,380	12	0
J. Hunt, Gosport	1,337	0	0
G. H. Riches, Fareham	1,258	17	6
Glover & Son, Fareham	1,250	0	0
M. H. Gibbs, Lee-on-the-Solent	1,224	0	0
*F. W. Bartlett, Fareham	1,215	0	0

FEATHERSTONE.—The U.D.C. has accepted the following tenders for relaying of the Snydale outfall sewer:—
A. Graham, Fartown, Huddersfield.. £4,800
(*Subject to approval of the M.H.*)

GLASGOW.—Erection of extensive sugar factory in Jamaica:—
Duncan Stewart & Co., Glasgow
approx. £200,000

GLASSHOUGHTON (YORKS).—Erection of foreman's house at the Airedale Sewerage Works, for the Pontefract Sanitary Committee, R.D.C.:—
L. Rodgers & Sons, Castleford £452

HANGING-HEATON.—Reconstruction of the "Fox and Hounds" Hotel, for Messrs. Ind, Coope & Co., Ltd., Burton Brewers. A. & F. Mosley, Leeds, architects:—
*R. Lawson, 90, Dewsbury-road, Leeds.

HORBURY.—Erection of a new steel railway bridge, for the London, Midland & Scottish Railway Co.:—
John Butler & Co., Ltd., Stanningley, near Leeds.

HOUGHTON.—For the erection of 12 houses, on Hetton-road site, for the U.D.C.:—
*I. Berriman, Fence Houses.... £338 per house

HOVE.—For erection of dressing-rooms in Hove Park, for the T.C.:—
*A. W. Leney..... £184 15

HULL.—For erection of 26 houses on Cottingham-road Estate, for the T.C. The City Architect, Council Offices, Hull:—
*P. T. Kettlewell, Hull £9,220

HUNSTANTON.—For resetting bench of retorts, for the U.D.C.:—
*Drake £310

KIDDERMINSTER.—For paving in Comberton-hill with stone setts, for the Highways Dept. of the T.C.:—
*G. Law, Kidderminster..... £8,933

LONDON.—For laying asphalte matrix road surface on roadway on Blackheath, from Maze-hill to the borough boundary, for the Greenwich B.C.:—
*Val de Travers Paving Co.—at 16s. per yd. super and eight years' maintenance at 4d. per yd. super per annum.

LONDON.—For supplying and laying compressed asphalte in the following roads, viz., Tower Bridge-road, Guy-street, Kipling-street, Richardson-street, Stainer-street Arch, Weston-street Arch, Neckinger, Market-street, and Weston-street (Long-lane to Snowsfields), for the Bermondsey B.C.:—
Neuchatel Asphalte Co., Ltd.—
12s. 6d. per sq. yd., 5 years free maintenance.
Limmer & Trinidad Lake Asphalte Co., Ltd.—
12s. 6d. per sq. yd., 5 years free maintenance.
French Asphalte Co., Ltd.—
12s. 3d. per sq. yd., 5 years free maintenance.
T. Faldo & Co., Ltd.—
10s. 10d. per sq. yd., 1st and 2nd years free maintenance; 3rd year 3d. per yd.; 4th and 5th years 6d. per yd., measured all over.
Highways Construction, Ltd.—
10s. 3d. per sq. yd., 3 years free maintenance; further 2 years maintenance at 4d. per yd. super, per annum.
London Asphalte Co., Ltd.—
10s. per sq. yd., 5 years free maintenance.
Whitehall Asphalte & Engineering Co., Ltd.—
9s. 4d. per sq. yd., 7 years free maintenance.
*Val de Travers Asphalte Paving Co., Ltd.—
9s per sq. yd., 5 years free maintenance.

LONDON.—For supply of materials to the Lewisham B.C.:—
*Improved Wood Pavement Co., Ltd.—for creosoted deal blocks 8 in. by 3 in. by 4 in., at £9 17s. 6d. per 1,000.
*Sir Wm. Burnett & Co., Ltd.—for creosoted deal blocks 8 in. by 3 in. by 3½ in., at £8 17s. 6d. per 1,000.
*Wettern Bros., Ltd.—for 6 in. by 12 in. Norway granite kerb, at 2s. 7½d. per foot run.
*Atlas Stone Co., Ltd.—for 2 in. artificial stone paving, at 5s. 11d. per super yd.

NORFOLK.—Construction of two swing bridges over the Waveney, at Beccles and St. Olaves, for the London & North Eastern Railway Co.:—
*Horseley Bridge and Engineering Co., Tipton £150,000

NORTHAMPTON.—For erection of 20 houses, "A" 3 type (non-parlour and 3 bedrooms), for the T.C.:—
*Walker & Perrett, Northampton..... £7,890

NORTHAMPTON.—For completion of four houses and four shops, Abington site, for the T.C.:—
*A. P. Hawton & Sons, Ltd..... £1,849

NORTHAMPTON.—For decorative repairs to (1) 32 houses, London-road; (2) 40 houses, Queen Eleanor-road, Queen Eleanor-terrace and Towcester-road, for the T.C.:—
*(1) F. Brown £170
*(2) W. B. Parbery 217

NORWICH.—For erection of six cottages, at Whitlingham Farm, for the T.C.:—
*Walter Evans & Son, Norwich £2,598 15

PONTEFRACT.—Erection of 10 houses on the Wakefield-road site, for the Corporation:—

Builder—Wm. Horner	£2,099	17	10
Joiner—C. L. Jackson	1,120	0	0
Plumber—W. Pearson & Sons ..	555	0	0
Tiler—Stewart Bros. & Son....	445	15	0
Plasterer—T. W. Senior	250	0	0
Painter—Hy. Butler & Sons ..	125	18	4
Roadmaker—Wm. Horner	156	5	6
	£4,752	16	8

PONTEFRACT.—Erection of 24 houses on the Baghill-road site:—

Builder—Wm. Horner	£4,640	2	0
Joiner—C. L. Jackson.....	2,620	0	0
Plumber—W. Pearson & Sons..	1,104	0	0
Tiler—George Spurr & Sons ..	865	4	0
Plasterer—T. W. Senior	600	0	0
Painter—Hy. Butler & Sons....	306	4	0
Roadmaker—Wm. Horner	572	5	0
	£10,707	15	0

PORTSMOUTH.—For erection and completion of four blocks of flats, Landport, and maintenance for six months, for the T.C. Mr. A. W. Ward, Borough Engineer, Town Hall, Portsmouth:—

Cortes & Hankins, Drayton ..	£8,073	6	3
Light Bros. & Flowers, Portsmouth	7,924	0	0
John Lay & Co., Portsmouth ..	7,654	0	0
E. & A. Sprigings, Portsmouth	7,295	0	0
*Tanner Bros., Castle-road, Southsea	6,400	0	0

RADCLIFFE.—For erection of 16-Chamber "Manchester" Kiln, Outwood Brickworks, for the Company. Mr. W. Beech, Building Surveyor, The Clifton & Kenley Coal Co., Clifton, Manchester:—
*Dean, Hetherington & Co., Leek..... £3,800

RADCLIFFE.—For erection of 26 semi-detached cottages, Outwood-road, for the Outwood Collieries Co., Ltd. Mr. W. Beech, Building Surveyor, The Clifton & Kenley Coal Co., Clifton, Manchester :—

*G. & T. Seddon, Manchester.... per house £405

READING.—For erection of additions to factory, for Messrs. M. Venner & Sons, Ltd. Mr. F. G. Sainsbury, architect, 154, Friar-street, Reading :—

*W. J. Harris, Basingstoke..... £8,978

ROTHERHAM.—For conversion of privies into water-closets at Treeton, for the R.D.C. Mr. C. O. Rawstron, Surveyor, Council Offices, Grove-road, Moorgate, Rotherham :—

*Chas. Boyd, Rotherham.

ROYSTON.—For erection of 12 houses, Station-road. Messrs. Dyson, Cawthorne & Coles, 10, Regent-street, Barnsley :—

The Royston Builders & Contractors, Ltd.—Houses : £4,200 ; Roads and sewers : £330

SALFORD.—For erection of house at sewage works. Weaste, for the T.C. :—

*A. Fenton, Manchester..... £766

SALFORD.—For extension of Langworthy-road, for the T.C. :—

*W. H. Worthington, Manchester £7,919 16 11

SKIPTON.—Construction of a new bridge. for the L. M. & S. Railway Co. :—

*John Butler & Co., Ltd., Stanningley, near Leeds.

SLAITHWAITE.—For erection of branch store. Lingards, for the Co-operative Society, Ltd. Messrs. J. Berry & Sons, architects, 3, Market-place, Huddersfield :—

Mason—Wm. Holroyd & Sons, Huddersfield.
Joiner—Wrigley & Beaumont, Huddersfield.
Plumber—T. H. Shaw, Huddersfield.
Plasterer—W. Bamforth, Longlands, Huddersfield.
Slater—W. E. Jowitt, Huddersfield.
Concretor—E. H. White, Huddersfield.
Electrician—Wm. Camp, Huddersfield.
Heating—Major & Co., Huddersfield.
Steelwork—W. H. Heywood & Co., Huddersfield.
Marble Slab—Walter Fisher, Huddersfield.
Tiling—Craven Dunnill & Co., Ltd., Jackfield.

STAFFORD.—For (1) laying and jointing 2,470 yds. of 6 in. dia. cast-iron pipes and special castings ; (2) 650 yds. of 21 in. dia. reinforced concrete pipe sewer, &c., for the T.C. Mr. W. Plant, Borough Engineer and Surveyor, Borough Hall, Stafford :—

*(1) J. Taylor & Sons, Stoke-on-Trent	£630	5	0
*(2) G. Sandy & Co., Stafford	865	2	4

STAFFORD.—For the erection of twenty houses in Blackwalls North and South, for the T.C. :—

*Espley & Son, Contract No. 1 (11 houses	£3,784	0	
Contract No. 2 (3 houses)	1,047	0	
*G. Dyke & Son, Contract No. 3 (3 houses)	1,148	15	
*G. Sandy & Co., Contract No. 4 (3 houses)	1,155	0	

STAFFORD.—For laying concrete floor in Fish Market, for the T.C. :—

*F. Espley & Son £434

STAFFORD.—For laying 6 in. diameter water main along Silkmore-lane, for the T.C. :—

*J. Taylor & Son, Stoke-on-Trent.... £630 5

STAFFORD.—For piping of Thieves' Ditch for the T.C. :—

*G. Sandy & Co..... £865 2 4

STOWMARKET.—For erection of isolation hospital for the U.D.C. :—

Seaman & Cole, Stowmarket.. £3,195 16 9

STRETFORD.—For paving works, for the U.D.C. :

*Bethell & Sons : Repaving in 12 public streets	£12,868	6	5
*W. Turner (Ardwick), Ltd. : Repaving in Empress-street	1,143	14	0

TILBURY.—For reconstruction in reinforced concrete of Dock-road, area 11,200 sq. yds., for the U.D.C. Mr. S. A. Hill-Willis, Surveyor, Council Offices, Tilbury :—

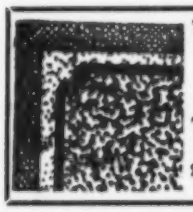
†F. Mitchell & Son, Manchester..... £5,610

WEYMOUTH.—For making-up Baycliffe-terrace, for the T.C. :—

Jesty & Baker	£229	8	0
W. Whettam	207	7	6
*Jenkins, Hitt & Grant, Ltd.	160	0	0

WIVENHOE.—For erection of a statuary marble memorial in the cemetery. Mr. H. Fuller-Clark, architect, 11, John-street, Bedford-row, W.C. :—

H. T. Jenkins & Son, Ltd., Torquay	£147	10	
Fenning & Co., Hammersmith	141	10	
*E. J. & A. T. Bradford, London	100	0	



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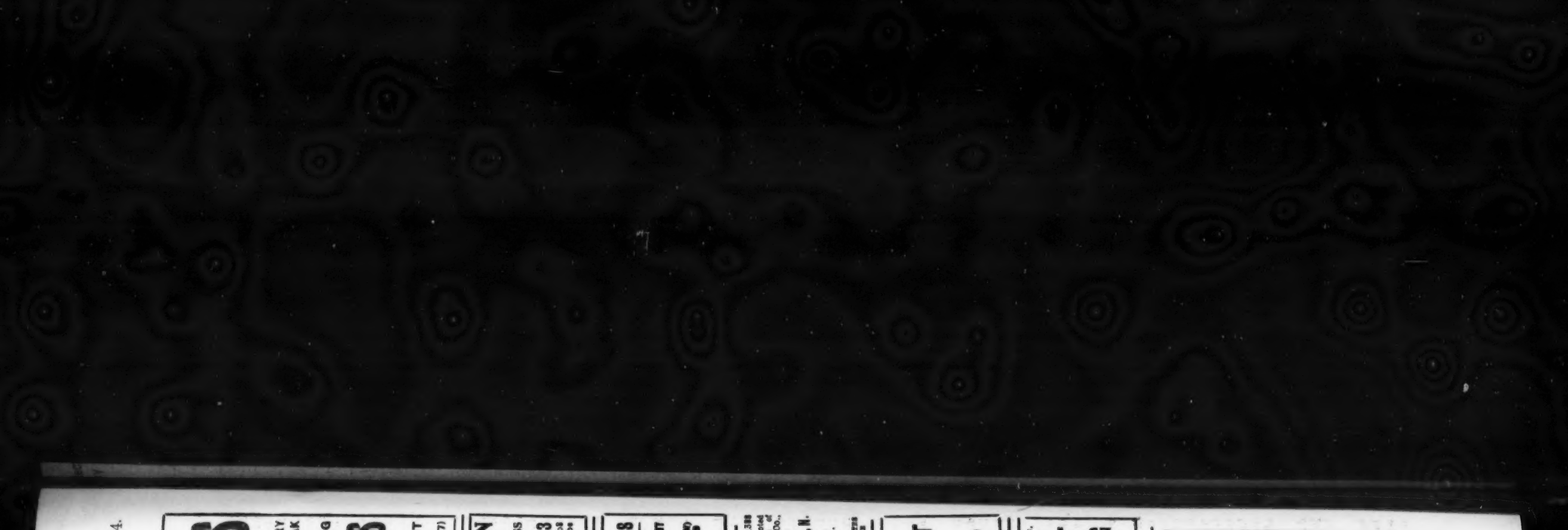
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